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THE TRANSACTIONS

OF THE

EDINBURGH OBSTETRICAL SOCIETY.

VOL. XXII.

SESSION 1896-97.

EDINBURGH: OLIVER AND BOYD,
PUBLISHERS TO THE SOCIETY.
1897.

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PREFACE.

THIS, the twenty-second volume of the Society's Transactions, contains a record of its proceedings during the Session 1896–97.

In it, as in former volumes, the views brought forward in the papers are to be considered as those of the writers themselves and not as those of the Society as a body.

A general Index to the Transactions was prepared and included in Volume XXI.

THE EDITOR.

October 1897.

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John W. Ballantyne, M.D., F.R.C.P. Ed., ... 1896

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1890 Apostoli, Dr, 5 Rue Molière, Paris.

1897 Bantock, Dr George Granville, 12 Granville Place, Portman Square, London, W.

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1886 Bozeman, Dr Nathan, 296 Fifth Avenue, New York.

1891 Budin, Prof., Avenue Hoche 4, Paris.

1886 Chiara, Prof., Domenico, Florence.

1882 Emmet, Dr, 93 Madison Avenue, New York.

1882 Freund, Professor, Kaiser Wilhelm's University, Strassburg.

1891 Gusserow, Prof., Charité, Berlin.

1891 Halbertsma, Professor, Utrecht.

1882 Hegar, Professor, Albert Ludwig's University, Freiburg.

1892 Koeberlé, Dr Eugene, Strassburg.

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1893 Moir, Dr John, 52 Castle Street.

1892 Müller, Professor Peter, Berne, Switzerland.

1897 Mundé, Dr Paul F., 20 West Forty-fifth Street, New York.

1851 Oldham, Dr Henry, Marufa, Boscombe, Bournemouth.

1889 Olshausen, Professor, Frauenklinik, Artillerie Strasse 13, Berlin.

1882 Parvin, Professor, 1626 Spruce St., Philadelphia.

1895 Pinard, Professor A., 10 Rue Cambacérès, Paris.

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1882 Schultze, Professor B. S., University, Jena.

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1892 Slavjansky, Professor R. J., Rue Liteinaia 24, St Petersburg.

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1856 Skinner, Dr T., London.

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95	Andrew Stark Currie, M.D., M.R.C.S. Eng., *London*,	1882
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	W. Fraser Macdonald, M.B., C.M., *Auchtermuchty*,	1884
	William Spence, M.B., C.M., *Dollar*,	1884
	Alexander Thom, M.D., C.M., *Crieff*,	1884
110	William Wright Millard, M.B., C.M.,	1884
	John Mowat, M.D., C.M.,	1884

		Date of Admission.
	William John Beattie, L.R.C.P. Ed., L.F.P. & S. Glasg., *Stockton-on-Tees*,	1884
	James Lumsden Bell, M.B., C.M., *Driffield, Yorkshire*,	1884
	Thomas Brown Darling, M.D., C.M.,	1884
115	Harry Melville Dunlop, M.D., F.R.C.P. Ed.,	1884
	*Robert William Felkin, M.D.,	1884
	James K. King, M.D., *Watkins, New York*,	1884
	William Marshall, L.R.C.S. Ed., *Milnathort*,	1884
	William Richardson, M.D., F.R.C.S. Ed., *Bristol*,	1884
120	Fourness Barrington, M.B., F.R.C.S. Eng., *Sydney, Australia*,	1884
	Francis William Nicol Haultain, M.D., F.R.C.P. Ed.,	1884
	*John Struthers Stewart, L.R.C.P. & S. Ed.,	1884
	W. G. Anglin, M.D., C.M., *Kingston, Ontario*,	1885
	Alexander Campbell, M.D., F.R.C.S. Ed., *Dundee*,	1885
125	Charles Batten Gracie, L.R.C.P. Ed., M.R.C.S. Eng., *Burnt-island*,	1885
	Frederick Anastasius Saunders, F.R.C.S. Ed., L.R.C.P. Ed., *Grahamstown, South Africa*,	1885
	John Smith, M.D., M.R.C.S. Eng., *Kirkcaldy*,	1885
	Allan Cuthbertson Sym, M.D., C.M.,	1885
	Frederick J. Underhill, F.R.C.S. Ed., L.R.C.P. Ed., *British Columbia*,	1885
130	William Gayton, M.D., M.R.C.P.L., M.R.C.S. Eng., *London*,	1885
	*Alexander Matthew, F.R.C.S. Ed., *Corstorphine*,	1885
	Thomas Cargill Nesham, M.D., M.R.C.S. Eng., *Newcastle-on-Tyne*,	1885
	Alexander Somerville Cumming, M.D., F.R.C.P. Ed.,	1885
	Gustave Michael, M.B., C.M., *London*,	1885
135	Selwyn Hale Puckle, M.B., C.M., *Bishop's Castle, Shropshire*,	1885
	*James Haig Ferguson, M.D., F.R.C.P. Ed., M.R.C.S. Eng.,	1885
	John Edward Gemmell, M.B., C.M., *Liverpool*,	1885
	Robert Stewart, M.B., C.M.,	1885
	Surgeon-Captain Robert Charles Macwatt, M.B., B.Sc., C.M., 7th Bengal Cavalry, *Bombay*,	1885
140	*E. H. Lawrence Oliphant, M.D., C.M., *Glasgow*,	1885
	Andrew Wallace Walker, L.R.C.P. Ed., L.F.P. & S. Glasg.,	1886
	James Hogarth Pringle, M.B., F.R.C.S. Eng., *Glasgow*,	1886
	Walter Blake Nisbet, M.B., C.M., *N. Queensland*,	1886
	Robert Swan Aitchison, M.D., F.R.C.P. Ed.,	1886
145	John Walton Hamp, L.F.P. & S. Glasg., L.S.A., *Wolverhampton*,	1886
	John Dickinson Leigh, M.B., C.M., *Brotton, Yorkshire*,	1886
	James Auriol Armitage, M.D., C.M., *Wolverhampton*,	1886
	William Henry Miller, M.D., F.R.C.P. Ed.,	1886
	John M'Call, L.R.C.P. Ed.,	1886
150	Thomas Wood, M.B., C.M.,	1886
	F. E. Drumheller, M.D., *Sunbury, Pennsylvania*,	1887
	Hugh M'Callum, L.R.C.P. & S. Ed., *Kinloch-Rannoch*,	1887
	Nutting Stuart Fraser, M.B., M.R.C.S. Eng., *St John's, Newfoundland*,	1887
	George Franklin Shiels, M.D., F.R.C.S. Ed., *San Francisco*,	1887
155	Alexander MacLachlan, M.B., C.M., *Beauly*,	1887
	Augustus Alexander Matheson, M.D., F.R.C.P. Ed.,	1887
	Robert Mackenzie, M.D., C.M.,	1887
	Simon Linton, M.B., C.M., *Grangemouth*,	1887
	Thomas Jackson Thyne, M.B., F.R.C.P. Ed.,	1887
160	W. Burns Macdonald, M.B., C.M., *Dunbar*,	1887
	Charles William J. Chepmell, M.D., L.R.C.P. & S. Ed., *Brighton*	1887
	John St Clair Boyd, M.D., M.Ch., *Belfast*,	1887
	Briton Smallman Robson, M.B., C.M., *Newcastle-on-Tyne*,	1887
	Ernest T. Roberton, M.D., M.R.C.S. Eng., *New Zealand*,	1887
165	*Samuel Sloan, M.D., F.F.P. & S. Glasg., *Glasgow*,	1887

		Date of Admission
	James Wm. Fox, L.R.C.P. & S. Ed., *London*,	1887
	John Frederick Sturrock, M.B., C.M., *Broughty-Ferry*,	1887
	Alexander Primrose, M.B., M.R.C.S. Eng., *Toronto, Canada*,	1887
	Arthur Perigal, M.D., M.R.C.S. Eng., *New Barnet, Herts*,	1887
170	James Aitken Clark, M.B., C.M.,	1887
	Edward Carmichael, M.D., F.R.C.P. Ed.,	1887
	Percival Humble Watson, M.R.C.S. Eng., L.R.C.P. Ed., *Newcastle-on-Tyne*,	1887
	Charles Clark Teacher, M.B., C.M.,	1887
	Robert Inch, M.B., C.M., *Gorebridge*,	1887
175	Ellis Thomas Davies, M.D., M.R.C.S. Eng., *Liverpool*,	1887
	John Orr, M.B., C.M., *Manchester*,	1887
	George Owen Carr Mackness, M.D., C.M., *Broughty-Ferry*,	1887
	Francis Joseph Baildon, M.B., C.M., *Southport*,	1887
	Surgeon-Lt. Ralph H. Maddox, M.B., M.R.C.S. Eng., I.M.S., *Bombay*,	1887
180	James Williamson Martin, M.D., F.R.C.P. Ed., *Dumfries*,	1887
	James Andrew Blair, M.B., C.M., D.Sc., *Straiton, Maybole*,	1887
	John Robert Henry Dubourg, L.R.C.P. & S. Ed., *Liverpool*,	1887
	*John Thomson, M.D., F.R.C.P. Ed.,	1887
	Tennent Ronalds, L.R.C.P. & S. Ed., *Killochan Castle, Girvan*,	1887
185	William M'Creadie, M.B., M.R.C.P. Ed.,	1887
	Robert Kirk, M.D., F.R.C.S. Ed., *Bathgate*,	1887
	*William Fraser Wright, M.B., C.M., *Leith*,	1887
	Alexander Bruce, M.D., F.R.C.P. Ed.,	1887
	Richard Joseph Trestan, L.R.C.P. & S. Ed., *Retford, Notts*,	1887
190	Robert Henry Blaikie, M.D., F.R.C.S. Ed.,	1888
	James Hutcheson, M.D., F.R.C.S. Ed.,	1888
	A. A. Jervis Pereira, M.D., *Delagoa Bay*,	1888
	Christopher Martin, M.B., F.R.C.S. Eng., *Birmingham*,	1888
	John George Havelock, M.D., C.M., *Montrose*,	1888
195	John Pirie, M.B., C.M.,	1888
	John Gibson Graham, M.B., C.M., *Glasgow*,	1888
	William Augustus Gibson, L.R.C.P. & S. Ed., *Streatham*,	1888
	Robert Adams Brewis, M.D., C.M., *Reading, Berks*,	1888
	John Allison, M.D., C.M., *Kettering, Northampton*,	1888
200	Surgeon-Captain Charles H. Bedford, M.D., D.Sc., M.R.C.S. Eng., Bengal Army, *Bombay*,	1888
	Archibald Cowan Guthrie, M.B., C.M.,	1888
	John Cunninghame, M.B., C.M., *New Zealand*,	1888
	Samuel Beatty, M.B., C.M., *Pitlochry*,	1888
	Professor James Chalmers Cameron, M.D., *Montreal*,	1888
205	Albert Edward Morison, M.B., F.R.C.S. Ed., M.R.C.S. Eng., *Hartlepool*,	1888
	George H. Temple, M.B., C.M., *Weston-super-Mare*,	1888
	Norman L. Boxill, M.B., C.M., *Barbados*,	1888
	Khumar B. Narayan, L.R.C.P. & S. Ed., *Cooch Behar, India*,	1888
	John Hunter Helm, M.B., C.M., *Ratho*,	1888
210	William Lundie, M.D., C.M.,	1888
	George Scott MacGregor, M.D., C.M., *Glasgow*,	1888
	William Sneddon, M.B., C.M., *Cupar-Fife*,	1888
	Thomas Watts Eden, M.B., C.M., *London*,	1888
	William Fordyce, M.D., C.M.,	1888
215	Charles E. Harvey, M.B., M.R.C.S. Eng., *Sav-la-Mar, Jamaica*,	1889
	Frederick E. Welby, F.R.C.S. Ed., *St Helena*,	1889
	Alexander Lang Murray, L.R.C.P. & S. Ed.,	1889
	George Pirrie Boddie, M.B., C.M.,	1889
	James F. W. Ross, M.D., *Toronto, Canada*,	1889
220	J. Stuart Nairne, F.R.C.S. Ed., F.F.P. & S. Glasg., *Glasgow*,	1889
	John David Williams, M.D., C.M., *Cardiff*,	1889
	James S. Fox, M.B., M.R.C.S. Eng., *St Helens*,	1889

		Date of Admission.
	S. M'Murtry, M.D., *Louisville, Kentucky, U.S.A.*,	1889
	Hugh Jamieson, M.D., C.M.,	1889
225	Thomas Wm. Nassau Greene, L.R.C.P. Ed., L.R.C.S.I., *London*,	1889
	John Clarence Webster, M.D., F.R.C.P. Ed., *Montreal*,	1889
	William George Aitchison Robertson, M.D., F.R.C.P. Ed.,	1889
	John Edward Sang, L.R.C.P. & S. Ed., *London*,	1889
	William Basil Orr, M.D., C.M.,	1889
230	Frederick Mann, M.B., C.M., *Ashton-on-Lyne*,	1889
	Edward Farr Armour, M.B., C.M.,	1889
	William C. Little, M.D., *Victoria, Australia*,	1889
	George Wilkinson, M.D., C.M., *Liverpool*,	1889
	James Lamond Lackie, M.D., M.R.C.P. Ed.,	1889
235	James Wilson, M.B., C.M.,	1889
	Alexander John Keiller, L.R.C.P. & S. Ed., *North Berwick*,	1889
	Archibald Maclean, M.D., C.M., *Kilmarnock*,	1890
	Frederick William Lyle, M.D., C.M., *London*,	1890
	Thomas Dobson Poole, M.D., C.M., *St Anne's-on-the-Sea*,	1890
240	Walter Scott Gibson, M.B., C.M., *London*,	1890
	Charles Newberry Cobbett, M.D., C.M., *London*,	1890
	Alexander William Gordon Price, M.B., C.M.,	1890
	Hugh Shapter Robinson, M.R.C.S. Eng., L.R.C.P. Ed., *London*,	1890
	George Matheson Cullen, M.D., C.M.,	1890
245	Frederick Albert Lawton Lockhart, M.B., C.M., *Montreal, Canada*,	1890
	Edmund Frederick Tanney Price, M.B., C.M.,	1890
	George Lovell Gulland, M.D., F.R.C.P. Ed.,	1890
	Ernest Theophilus Roberts, M.B., C.M., *Keighley*,	1890
	Owen Foulkes Evans, M.D., C.M., *Liverpool*,	1890
250	James Duncan Farquharson, M.B., C.M., *Newcastle-on-Tyne*,	1890
	William Smith, L.R.C.P. & S. Ed.,	1890
	Harvey Littlejohn, M.B., F.R.C.S. Ed.,	1890
	Carstairs Cumming Douglas, M.D., C.M., *Skelmorlie, Ayrshire*,	1890
	Robert Wise, M.D., C.M., *London*,	1890
255	William Russell, M.D., F.R.C.P. Ed.,	1890
	William Paterson, M.B., C.M., *Glasgow*,	1890
	Alexander Scott Duncan, M.B., C.M., *London*,	1890
	Prof. William Keiller, F.R.C.S. Ed., *Galveston, Texas, U.S.A.*,	1890
	Michael Dewar, M.D., C.M.,	1891
260	Gains T. Smith, M.D., *Moncton, New Brunswick*,	1891
	John Hugh Alexander Laing, M.B., C.M.,	1891
	Robert Thin, M.B., F.R.C.P. Ed.,	1891
	Charles Edward Lester, L.R.C.P. & S. Ed., *Australia*,	1891
	Alexander H. Vassie, M.B., C.M., *London*,	1891
265	James Harvey, M.B., C.M.,	1891
	Alexander Henderson, M.B., C.M.,	1891
	James Smith, M.B., C.M.,	1891
	C. Carty Salmon, L.R.C.P. & S. Ed., *Melbourne, Australia*,	1891
	George Balfour Marshall, M.D., C.M., *Glasgow*,	1891
270	Edward Henry Alexander, M.B., M.R.C.S. Eng., *New Zealand*,	1891
	William Booth, F.R.C.S. Ed.,	1891
	Harry St Clair Gray, M.D., C.M., *Glasgow*,	1891
	Richard T. Yoe, M.D., *Louisville, Kentucky, U.S.A.*,	1891
	Alexander Bruce Giles, M.D., C.M.,	1891
275	James Y. Simpson Young, M.B., C.M.,	1891
	Hamilton G. Langwill, M.B., M.R.C.P. Ed., *Leith*,	1891
	Herbert Ernest Lee, M.B., C.M., *Australia*,	1891
	Charles Martin, M.B., C.M., *Birmingham*,	1892
	William Murray Cairns, M.B., C.M., *Liverpool*,	1892
280	Robert Dundas Helm, M.D., C.M., *Carlisle*,	1892
	William Wood, M.B., C.M.,	1892
	James Thomas Moore Giffen, F.R.C.S. Ed., *Chester*,	1892
	John Alexander Robertson, M.B., C.M., *Cape Colony*,	1892

		Date of Admission.
	Frank Dendle, M.B., C.M., *Lochgelly*,	1892
285	Julius Henry Beilby, M.B., C.M.,	1892
	Frederick Thomas Anderson, M.D., F.R.C.S. Ed., *Barnstaple*,	1892
	J. Gordon Smith, L.R.C.P. & S. Ed., *West Africa*,	1892
	Simson Carstairs Fowler, M.B., C.M., *Juniper Green*,	1892
	Hugh Ernest Fraser, M.D., C.M., *Dundee*,	1892
290	John Alexander Campbell Kynoch, M.B., M.R.C.P.Ed., *Dundee*,	1892
	Alexander Brown Ritchie, M.B., C.M., *Hulme, Manchester*,	1892
	Walter John Shaw, M.B., C.M., *Cockburnspath*,	1892
	Robert Stirling, M.D., C.M., *Perth*,	1892
	William Henry Vickery, F.R.C.S. Eng., L.R.C.P. Lond., *Newcastle-on-Tyne*,	1892
295	George Foggin, L.R.C.P. & S. Ed., *Newcastle-on-Tyne*,	1892
	William Ramsay Smith, M.B., C.M., *Australia*,	1892
	A. Watson Munro, M.D., *Sydney, Australia*,	1892
	Charles Frederick Ponder, M.B., C.M., *Darjeeling, India*,	1892
	John Tod, M.B., C.M., *Leith*,	1892
300	Richard J. Erskine Young, M.D., C.M.,	1892
	George Thomas Cooke Adams, L.R.C.P. & S. Ed., *Melbourne, Australia*,	1892
	George Henry Walter Smith, M.D., C.M., *Sydney, Australia*,	1892
	John Lawson Dick, M.B., C.M., *Liverpool*,	1892
	Charles Croomhall Easterbrook, M.B., C.M.,	1892
305	Walter Petrie Simpson, M.B., C.M., *Lincolnshire*,	1892
	James Ernest Moorhouse, M.D., C.M., *Stirling*,	1892
	Alfred James Anderson Peters, L.R.C.P. & S. Ed.,	1892
	D. W. Johnston, F.R.C.S. Ed., *Johannesburg, South Africa*,	1892
	David George Davidson, M.B., C.M.,	1892
310	Allen Thomson Sloan, M.D., C.M.,	1893
	Robert Balfour Graham, F.R.C.S. Ed., *Leven, Fife*,	1893
	Albert Frederick Rosa, M.B., C.M.,	1893
	George Benjamin Mitchell, M.B., C.M., *Whitby*,	1893
	Andrew Walker, M.D., C.M., *Sheffield*,	1893
315	H. Robins, M.D., *Jamaica*,	1893
	L. J. Schofield, M.D., *Warrensburg, Mo., U.S.A.*,	1893
	David Milligan, M.B., C.M.,	1893
	George Morton Wilcockson, L.R.C.P. & S. Ed., *Reading*,	1893
	Albert Franklin M'Vety, M.D., M.R.C.S. Eng., *Toledo, Ohio*,	1893
320	John MacRae, M.D., C.M., *Murrayfield*,	1893
	Ernest Switzer Forde, L.R.C.P. & S. Ed., *Dalry, Galloway*,	1893
	George Wade, M.D., C.M., *Melrose*,	1893
	Philip Grierson Borrowman, M.B., C.M., *Elie, Fife*,	1893
	John Liddell, M.D., C.M., *Harrogate*,	1893
325	William Herbert Gregory, M.D., C.M., *Beverley, Yorks*,	1893
	Ernest Coleman Moore, M.B., C.M.,	1893
	Cuthbert Christy, M.B., C.M., *Broomfield*,	1893
	Robert Hutchison, M.D., M.R.C.P. Ed., *London*,	1893
	James Gibson Cattanach, M.B., C.M.,	1893
330	George Elder, M.D., M.R.C.P. Ed.,	1893
	Alexander Maitland Easterbrook, M.B., C.M., *Gorebridge*,	1893
	W. H. M'Kenley, M.D., *New York*,	1893
	Robert William Roberts, L.R.C.P. & S. Ed., *South Wales*,	1894
	Claude Buchanan Ker, M.D., C.M.,	1894
335	John Malcolm Farquharson, M.B., C.M.,	1894
	Charles Alexander Butchart, M.B., C.M.,	1894
	Frederick Maurice Graham, L.R.C.P. & S. Ed., *India*,	1894
	Robert Hoggan, M.B., C.M., *Liberton*,	1894
	James Livingstone Thompson, M.B., C.M., *Australia*,	1894
340	George Stevenson Shirt Hirst, M.B., C.M., *Hinckley*,	1894
	John Stevens, M.D., F.R.C.P. Ed.,	1894
	Charles Isodon Bodon, M.D., *Budapest*,	1894
	Hugh Lewis Hughes, L.R.C.P. & S. Ed., *Dowlais*,	1894

		Date of Admission.
	Sylvanus Glanville Morris, M.D., C.M., *Nantgaredig*,	1894
345	Georges P. Coromilas, M.D., *Calamata, Greece*,	1894
	Thomas Easton, M.D., C.M., *Stranraer*,	1894
	David Robertson Dobie, M.D., C.M., *Coldstream*,	1894
	Gopal Govind Vatve, M.D., *Bombay*,	1894
	Robert William Beesley, M.B., C.M., *Bolton*,	1894
350	William A. Stephen, M.B., C.M., *Loftus-in-Cleveland*,	1894
	William Edward Fothergill, M.D., C.M., *Manchester*,	1894
	George Sandison Brock, M.D., C.M., *Rome*,	1894
	John M. Munro Kerr, M.B., C.M., *Glasgow*,	1894
	John Montgomery, M.B., C.M., *Birmingham*,	1895
355	Robert Cochrane Buist, M.D., C.M., *Dundee*,	1895
	Robert Thomson Ferguson, M.B., C.M., *Anstruther*,	1895
	A. Kennedy Melville, M.D., F.R.C.S. Ed.,	1895
	William Henry Stephenson, L.R.C.P.& S.Ed., L.F.P.& S.Glasg., *Manchester*,	1895
	Angus Vallance MacGregor, M.D., C.M., *Hartlepool*,	1895
360	Charles William Donald, M.B., C.M.,	1895
	Oguntola Sapara, L.R.C.P. & S. Ed., *Lagos, W. Africa*,	1895
	John Struthers, M.B., C.M., *Transkei, South Africa*,	1895
	B. W. Broad, M.B., C.M., *Cardiff*,	1895
	Edwin Hindmarsh, M.B., C.M., *Bengal*,	1895
365	Patrick Mackin, L.R.C.P. & S. Ed., *New Zealand*,	1895
	G. Edgar Helme, M.B., C.M., *Manchester*,	1895
	Percy T. Hughes, M.B., C.M., *Darlington*,	1895
	John Hosack Fraser, M.B., M.R.C.P. Ed., *Bridge of Allan*,	1895
	Stewart Grant Ogilvy, M.B., C.M.,	1895
370	T. Johnson-Alloway, M.D., *Montreal*,	1895
	Thomas Howard Morgan, M.D., F.R.C.S. Ed., *Queensland, Australia*,	1895
	William Macrae Taylor, M.B., C.M.,	1895
	David James Graham, M.B., C.M.,	1895
	Walter William Chipman, M.B., C.M., *Bolton*,	1895
375	Oswald Hanson Isard, M.B., C.M., *London*,	1896
	John Cumming, F.R.C.S. Ed., L.R.C.P. & S. Ed.,	1896
	Sol Jervois Aarons, M.D., C.M., *London*,	1896
	Robert Beveridge, M.B., C.M., *Leith*,	1896
	John Anderson, M.B., C.M., *Pitlochry*,	1896
380	Thomas John Burton, M.D., C.M., *Bearsden*,	1896
	Robert M. Leith, M.B., C.M., *Port Elizabeth, Cape Colony*,	1896
	Robert Gordon M'Kerron, M.B., C.M., *Aberdeen*,	1896
	Donald George Gordon Macdonald, M.D., C.M., *Aberdeen*,	1896
	Frederick John M'Cann, M.D., M.R.C.P.L., *London*,	1896
385	David Robert Taylor, L.R.C.P. & S. Ed., *Ayton*,	1896
	James Curtis Whyte, M.D., C.M., *Dalkeith*,	1896
	Hugh Eyres, M.B., C.M., *Gateshead*,	1896
	George William Simla Paterson, M.B., C.M.,	1896
	William Robert Martine, M.B., C.M., *Haddington*,	1896
390	Robert Henry Watson, M.B., C.M., *Hamilton*,	1896
	Thomas Marshall Callender, M.B., C.M.,	1896
	Lewis Grant, M.B., C.M.,	1896
	Robert Robertson, M.B., C.M.,	1897
	James Wilkie, L.R.C.P., & S.Ed., *Portobello*,	1897
395	Andrew Graham, M.D., *Currie*,	1897
	Douglas Chalmers Watson, M.B., C.M.,	1897
	Robert Mair, M.D., C.M., *Hawick*,	1897
	Roderick Murdoch Matheson, M.D., C.M.,	1897
	Robert Jardine, M.D., F.F.P.S. Glasg., M.R.C.S. Eng., *Glasgow*,	1897
400	Daniel Charles Edington, M.B., C.M., *Alva*,	1897
	Edwin Arthur Gibson, M.B., C.M., *Glasgow*	1897
402	John Macmillan, M.B., C.M., M.R.C.P. Ed.,	1897

Date of Admission.

ORDINARY FELLOWS.

ARRANGED ALPHABETICALLY.

(*a.*) LIFE MEMBERS.

Anderson, Dr John, Pitlochry, ... 1896
Barbour, Dr A. H. Freeland, 4 Charlotte Square, . . 1879
Craig, Dr William, 71 Bruntsfield Place, . . . 1870
Croom, Dr J. Halliday, 25 Charlotte Square, . . . 1870
5 Cumming, Dr John, 94 Gilmore Place, . . . 1896
Hart, Dr D. Berry, 29 Charlotte Square, . . . 1877
Johnston, Dr D. W., P.O. Box 2022, Johannesburg, South African Republic, ... 1892
Ponder, Dr Charles F., Guild Mission House, Kalimpong, Darjeeling, India, ... 1892
Ross, Dr James F. W., 481 Sherbourne Street, Toronto, Canada, 1889
10 Simpson, Professor A. R., 52 Queen Street, . . . 1858
Struthers, Dr John, Nqamakwe, Transkei, South Africa, . 1895
Vatve, Dr Gopal Govind, care of H.H. The Rajah of Miraj. Bombay, India, ... 1894

(*b.*) ANNUAL SUBSCRIBERS.

Aarons, Dr S. J., 15 Devonshire Place, Cavendish Square, London, W., ... 1896
Adam, Dr George Rothwell, Carlton House, Hotham Street, East Melbourne, Australia, ... 1879
15 Adams, Dr George T. Cooke, 32 Collins Street, Melbourne, Victoria, Australia, ... 1892
Affleck, Dr J. O., 38 Heriot Row, ... 1869
Aitchison, Dr R. S., 74 Great King Street, . . . 1886
Alexander, Dr E. H., Blenheim, New Zealand, . . 1891
Alexander, Dr W. B., 8 Blenheim Place, . . . 1882
20 Allison, Dr J., Fuller House, Kettering, Northampton, . 1888
Anderson, Dr Fred. T., Boutport Street, Barnstaple, Devonshire, 1892
Andrew, Dr James, 2 Atholl Crescent, ... 1868
Anglin, Dr W. G., 52 Earl Street, Kingston, Ontario, . 1885
Archibald, Dr J., 2 The Avenue, Beckenham, Kent, . . 1877
25 Armitage, Dr J. A., 28 Waterloo Road South, Wolverhampton, 1886
Armour, Dr E. F., 149 Bruntsfield Place, . . . 1889
Badger, Dr W., Penicuik, ... 1880
Baildon, Dr F. J., 57 Hoghton Street, Southport, . . 1887
Balfour, Dr Andrew, 12 Abercorn Terrace, Portobello, . 1877
30 Balfour, Dr G. W., 17 Walker Street, ... 1847
Ballantyne, Dr A., Dalkeith, ... 1870
Ballantyne, Dr J. W., 24 Melville Street, . . . 1883
Barrington, Dr Fourness, 213 Macquarrie Street, Sydney, Australia, ... 1884
Beatty, Dr Samuel, Craigvar, Pitlochry, . . . 1888
35 Beatty, Dr W. J., Stockton-on-Tees, ... 1884
Bedford, Surgeon-Captain Charles H., M.D., D.Sc., M.R.C.S. Eng., H.M. Indian Medical Service, care of W. Watson & Co., 28 Apollo Street, Bombay, ... 1888
Beesley, Dr R. W., Infirmary and Dispensary, Bolton, . 1894
Beilby, Dr Julius H., 10 Clarendon Crescent, . . . 1892

		Date of Admission
	Bell, Dr James L., Driffield, Yorkshire,	1884
40	Bell, Dr Robert, 29 Lynedoch Street, Glasgow, W.,	1878
	Bentley, Dr G. H., Kirkliston,	1877
	Beveridge, Dr Robert, 9 James Place, Leith,	1896
	Black, Dr Alexander, 13 Howe Street,	1881
	Black, Dr J. Watt, 15 Clarges Street, Piccadilly, London, W.,	1863
45	Blaikie, Dr R. H., 42 Minto Street,	1888
	Blair, Dr J. A., Straiton Manse, Maybole,	1887
	Bleloch, Dr A., 2 Lonsdale Terrace,	1876
	Boddie, Dr G. P., 147 Bruntsfield Place,	1889
	Bodon, Dr C. I., Király-utca 76, Budapest, Hungary,	1894
50	Booth, Dr William, 1 Minto Street,	1891
	Borrowman, Dr Philip G., Elie, Fife,	1893
	Boxill, Dr N. L., Buttalls, St George, Barbados,	1888
	Boyd, Dr J. St Clair, 27 Victoria Place, Belfast,	1887
	Brewis, Dr N. T., 23 Rutland Street,	1883
55	Brewis, Dr R. Adams, 148 Caversham Road, Reading, Berks,	1888
	Broad, Dr B. W., The Sanitorium, Cardiff,	1895
	Brock, Dr G. Sandison, 47 Piazza Barberini, Rome,	1894
	Brodie, Dr W. Haig, Battle, Sussex,	1881
	Bruce, Dr Alexander, 13 Alva Street,	1887
60	Buist, Dr J. W., 1 Clifton Terrace,	1877
	Buist, Dr R. C., Annfield House, Dundee,	1895
	Burton, Dr Thomas J., Lonsdale, Bearsden, Glasgow,	1896
	Butchart, Dr C. A., 26 Leith Walk, Leith,	1894
	Cairns, Dr W. Murray, 67 Catherine Street, Liverpool,	1892
65	Calder, Dr H. L., 60 Leith Walk, Leith,	1882
	Callender, Dr T. M., Inverard, Inverleith Gardens,	1896
	Cameron, Prof. James C., M.D., 941 Dorchester St., Montreal,	1888
	Campbell, Dr Alexander, 1 Clarendon Terrace, Dundee,	1885
	Cappie, Dr James, 37 Lauriston Place,	1862
70	Carmichael, Dr Edward, 21 Abercromby Place,	1887
	Carmichael, Dr James, 22 Northumberland Street,	1871
	Cattanach, Dr J. G., 3 Alvanley Terrace,	1893
	Chepmell, Dr Charles, 74 Dyke Road, Brighton,	1887
	Chipman, Dr W. W., Infirmary and Dispensary, Bolton	1895
75	Christy, Dr Cuthbert, Pryors, Broomfield, Essex	1893
	Church, Dr H. M., 36 George Square,	1875
	Clark, Dr J. A., 4 Cambridge Street,	1887
	Cobbett, Dr C. N., 29 Rosslyn Hill, Hampstead, London, N.W.,	1890
	Connel, Dr J., Peebles,	1869
80	Coromilas, Dr Georges P., Calamata, Greece,	1894
	Cox, Dr Joshua J., St Ronan's, Eccles, Manchester,	1876
	Croudace, Dr J. H., 23 Marston Road, Stafford,	1878
	Cullen, Dr G. M., 48 Lauriston Place,	1890
	Cumming, Dr A. S., 18 Ainslie Place,	1885
85	Cunninghame, Dr John, Port Chalmers, New Zealand,	1888
	Currie, Dr A. S., 81 Queen's Road, Finsbury Park, London, N.,	1882
	Darling, Dr T. Brown, 13 Merchiston Place,	1884
	Davidson, Dr D. G., 18 Granville Terrace,	1892
	Davies, Dr E. T., 97 Shaw Street, Liverpool,	1887
90	Dendle, Dr Frank, Lochgelly, Fife,	1892
	Deverell, Dr H. C., 12 Windsor Street,	1882
	Dewar, Dr M., 24 Lauriston Place,	1891
	Dick, Dr J. L., County Asylum, Rainhill, near Liverpool,	1892
	Dickson, Dr George, 9 India Street,	1867
95	Dobie, Dr D. R., Coldstream,	1894
	Donald, Dr C. W., 11 Braid Road,	1895
	Douglas, Dr Carstairs, 3 Eglinton Place, Skelmorlie, Ayrshire,	1890
	Drumheller, Dr F. E., 406 Market St., Sunbury, Pennsylvania,	1887
	Dubourg, Dr J. R. H., 120 Islington, Liverpool,	1887

		Date of Admission.
100	Duncan, Dr A. J., Nethergate House, Nethergate, Dundee,	1879
	Duncan, Dr A. S., Eversley, Penge, London, S.E.,	1890
	Dunlop, Dr H. M., 20 Abercromby Place,	1884
	Dunsmure, Dr J., 53 Queen Street,	1876
	Easterbrook, Dr A. M., Deanbank, Gorebridge,	1893
105	Easterbrook, Dr C. C., Morningside Asylum,	1892
	Easton, Dr Thomas, Hanover House, Stranraer,	1894
	Eden, Dr T. Watts, 6 Manchester Square, London, W.,	1888
	Edington, Dr D. C., Alva,	1897
	Elder, Dr George, 7 Leopold Place,	1893
110	Elder, Dr W. Nicol, 6 Torphichen Street,	1879
	Evans, Dr O. F., 71 Mulgrave Street, Liverpool,	1890
	Eyres, Dr Hugh, 10 Carlton Terrace, Low Fell, Gateshead,	1896
	Farquharson, Dr J. D., 242 Westgate Road, Newcastle-on-Tyne,	1890
	Farquharson, Dr J. M., 2 Coates Place,	1894
115	Felkin, Dr R. W., care of Mr Clay, 18 Teviot Place,	1884
	Ferguson, Dr J. Haig, 25 Rutland Street,	1885
	Ferguson, Dr R. T., Anstruther, Fife,	1895
	Finlay, Dr W. A., St Helen's, Russell Place, Trinity,	1880
	Foggin, Dr George, 63 Westmorland Road, Newcastle-on-Tyne,	1892
120	Forde, Dr E. S., Dalry, Galloway,	1893
	Fordyce, Dr William, 20 Charlotte Square,	1888
	Fothergill, Dr W. E., 200 Oxford Road, Manchester,	1894
	Foulis, Dr James, 34 Heriot Row,	1878
	Fowler, Dr Simson C., Juniper Green,	1892
125	Fox, Dr James S., 6 Baldwin Street, St Helen's,	1889
	Fox, Dr J. W., 68 Lupus Street, Pimlico, London, S.W.,	1887
	Fraser, Dr H. E., Royal Infirmary, Dundee,	1892
	Fraser, Dr J. Hossack, Bellfield, Bridge of Allan,	1895
	Fraser, Dr J. Joynor, Hessle, East Yorks,	1880
130	Fraser, Dr Nutting S., 205 Gower Street, St John's, Newfoundland,	1887
	Freeland, Dr Richard, Broxburn,	1879
	Gayton, Dr William, Bartram Lodge, Fleet Road, Hampstead, London, N.W.,	1885
	Gemmell, Dr J. E., 12 Rodney Street, Liverpool,	1885
	Gibson, Dr E. Arthur, 2 Queen's Crescent, Glasgow,	1897
135	Gibson, Dr W. A., 18 Leigham Vale, Streatham, Surrey,	1888
	Gibson, Dr W. Scott, 34 Dulwich Road, Herne Hill, London, S.E.,	1890
	Giffen, Dr J. J. M., 129 Boughton, Chester,	1892
	Giles, Dr A. B., 1 Kew Terrace,	1891
	Gilmour, Dr T. F., Port Ellen, Islay,	1882
140	Glaister, Dr John, 4 Grafton Place, Grafton Square, Glasgow,	1879
	Gracie, Dr C. B., Buccleuch Villa, Burntisland,	1885
	Graham, Dr A., Curriebank, Currie,	1897
	Graham, Dr D. J., 58 Lauriston Place,	1895
	Graham, Dr F. M., Elysium Hotel, Simla, India,	1894
145	Graham, Dr J. Gibson, 5 Ashgrove Ter., Partickhill, Glasgow,	1888
	Graham, Dr R. Balfour, Leven, Fife,	1893
	Grant, Dr Lewis, Royal Infirmary,	1896
	Grasett, Dr F. L., 208 Simcoe Street, Toronto, Canada,	1877
	Gray, Dr H. St Clair, 25 Lynedoch Street, Glasgow,	1891
150	Greene, Dr J. W. N., Beaumont House, Church Road, Forest Hill, London, S.E.,	1889
	Gregory, Dr W. H., North Bar Without, Beverley, Yorks,	1893
	Gulland, Dr G. L., 6 Alva Street,	1890
	Guthrie, Dr A. Cowan, 171 Constitution Street, Leith,	1888
	Hamilton, Dr J. R., Hawick,	1879
155	Hamp, Dr J. Walton, Penn Road, Wolverhampton,	1886
	Hardie, Dr Thomas, 10 John's Place, Leith,	1870
	Harvey, Dr Charles G., Kingswood, Sav-la-Mar, Jamaica, W.I.,	1889

		Date of Admission.
	Harvey, Dr James, 7 Blenheim Place,	1891
	Haultain, Dr F. W. N., 17 Rutland Street,	1884
160	Havelock, Dr J. G., Sunnyside, Montrose,	1888
	Hay, Dr Henry, 7 Brandon Street,	1879
	Helm, Dr J. H., Ratho,	1888
	Helm, Dr R. Dundas, 3 Alfred Street N., Portland Sq., Carlisle,	1892
	Helme, Dr G. Edgar, Gloucester House, Rusholme, Manchester,	1895
165	Henderson, Dr Alexander, 21 Pitt Street,	1891
	Henderson, Dr John, 7 John's Place, Leith,	1857
	Hewetson, Dr J., Holmfield, Reigate,	1881
	Hindmarsh, Dr Edwin, Mozufferpore, Tirhoot State Railway, Bengal, India,	1895
	Hirst, Dr George S. S., Wolvey Abbey, Hinckley, Leicestershire,	1894
170	Hoggan, Dr R., Constanceville, Liberton,	1894
	Hooper, Dr J. W. D., 70 Collins Street, Melbourne, Australia,	1884
	Hughes, Dr H. L., Gwernllwyn House, Dowlais, Glamorganshire,	1894
	Hughes, Dr P. T., Holy Trinity Vicarage, Darlington,	1895
	Hunter, Dr George, 33 Palmerston Place,	1881
175	Hurst, Dr George, Scott Chambers, 96 Pitt St., Sydney, N.S.W.,	1881
	Husband, Dr William, 4 Royal Circus,	1857
	Hutcheson, Dr J., 44 Moray Place,	1888
	Hutchison, Dr Robert, Toynbee Hall, Whitechapel, London, E.,	1893
	Inch, Dr Robert, Gorebridge,	1887
180	Isard, Dr O. H., Docharn, Elmbourne Road, Upper Tooting, London, S.W.,	1896
	Jamieson, Dr Hugh, 13 Lauriston Place,	1889
	Jamieson, Dr James, 43 George Square,	1866
	Jardine, Dr Robert, 5 Clifton Place, Glasgow, W.,	1897
	Johnson-Alloway, Dr T., 23 Mackay Street, Montreal,	1895
185	Johnston, Dr William, Stirling,	1871
	Keiller, Dr A. J., North Berwick,	1889
	Keiller, Prof. Wm., 1523 Thirty-first Street, Galveston, Texas, U.S.A.,	1890
	Ker, Dr C. B., City Fever Hospital,	1894
	Kerr, Dr J. M. Munro, 28 Berkeley Terrace, Glasgow,	1894
190	King, Dr J. K., The Glen Springs Sanitorium, Watkins, New York, U.S.A.,	1884
	Kirk, Dr Robert, Bathgate,	1887
	Kynoch, Dr Campbell, 8 Airlie Place, Dundee,	1892
	Lackie, Dr James, 2 Randolph Place,	1889
	Laing, Dr J. H. A., 11 Melville Street,	1891
195	Langwell, Dr H. G., 49 Charlotte Street, Leith,	1891
	Lee, Dr Herbert E., Gunnedah, N.S.W., Australia,	1892
	Leigh, Dr J. Dickinson, The White House, Brotton, Yorkshire,	1886
	Leith, Dr Robert M., Provincial Hospital, Port Elizabeth, Cape Colony, South Africa,	1896
	Lester, Dr Charles E., Mudgee, N.S.W., Australia,	1891
200	Liddell, Dr J., North View, Victoria Avenue, Harrogate,	1893
	Linton, Dr John, 60 George Square,	1863
	Linton, Dr Simon, Grangemouth,	1887
	Little, Dr W. C., Warracknabeal, Victoria, Australia,	1889
	Littlejohn, Dr Harvey, 10 Rutland Square,	1890
205	Lockhart, Dr F. A. L., 38 Bishop Street, Montreal, Canada,	1890
	Lucas, Dr Robert, Dalkeith,	1871
	Lundie, Dr William, 3 Glengyle Terrace,	1888
	Lyle, Dr F. W., 39 The Avenue, Castle Hill, Ealing, London, W.,	1890
	M'Call, Dr John, 4 Leopold Place,	1886
210	M'Callum, Dr H., Kinloch-Rannoch,	1887
	M'Cann, Dr F. J., 5 Curzon Street, Mayfair, London,	1896
	M'Creadie, Dr William, 164 Ferry Road,	1887
	Macdonald, Dr D. G. Gordon, 26 King Street, Aberdeen,	1896
	Macdonald, Dr W. B., 5 Roxburgh Terrace, Dunbar,	1887

		Date of Admission.
215	Macdonald, Dr W. Fraser, Auchtermuchty,	1884
	MacGregor, Dr A. V., Milton House, Milton Road, Hartlepool,	1895
	Macgregor, Dr G. S., 2 Burnbank Terrace, Glasgow,	1888
	Mackay, Dr George, 74 Bruntsfield Place,	1879
	M'Kenley, Dr W. H., 137 West 26th Street, New York,	1893
220	Mackenzie, Dr R., Napier Villa, 2 Morningside Road,	1887
	M'Kerron, Dr R. Gordon, 143 Union Street, Aberdeen,	1896
	Mackin, Dr Patrick, 102 Cuba St., Wellington, New Zealand,	1895
	MacLachlan, Dr A., Beauly,	1887
	M'Lean, Dr Archibald, Crosshouse, Kilmarnock,	1890
225	Macmillan, Dr John, 27 Warrender Park Road,	1897
	M'Murtry, Dr L. S., 231 West Chesnut Street, Louisville, Kentucky, U.S.A.,	1889
	M'Nab, Dr John, Bunessan, Oban,	1873
	Mackness, Dr G. O. C., Fort Street House, Broughty-Ferry,	1887
	MacRae, Dr John, Lynwood, Murrayfield,	1893
230	M'Vety, Dr A. Franklin, 235 12th Bath Street, Toledo, Ohio,	1893
	Macvie, Dr S., Chirnside,	1881
	M'Watt, Dr John, Morelands, Duns,	1879
	Macwatt, Dr R. C., 7th Bengal Cavalry, care of Messrs King, King & Co., Bombay,	1885
	Maddox, Dr Ralph H., I.M.S., care of Messrs William Watson & Co., 28 Apollo Street, Bombay,	1887
235	Mair, Dr Robert, Oliver Crescent, Hawick,	1897
	Mann, Dr F. W., 266 Katherine Street, Ashton-under-Lyne,	1889
	Marshall, Dr G. Balfour, 19 Sandyford Place, Glasgow,	1891
	Marshall, Dr William, Milnathort,	1884
	Martin, Dr Charles, 35 George Road, Edgbaston, Birmingham,	1892
240	Martin, Dr Christopher, 35 George Rd., Edgbaston, Birmingham,	1888
	Martin, Dr J. W., Burnfoot, Cluden, Dumfries,	1887
	Martine, Dr W. R., Weston, Haddington,	1896
	Matheson, Dr A. A., 41 George Square,	1887
	Matheson, Dr Roderick M., 41 George Square.	1897
245	Matthew, Dr Alexander, Corstorphine,	1885
	Melville, Dr A. Kennedy, 35 Mayfield Gardens,	1895
	Menzies, Dr David, 20 Rutland Square,	1877
	Messer, Dr Fordyce, Helensburgh,	1866
	Michael, Dr Gustave, 16 Finsbury Square, London, E.C.,	1885
250	Millard, Dr W. W., 3 George Place,	1884
	Miller, Dr W. H., 51 Northumberland Street,	1886
	Milligan, Dr D., 11 Palmerston Place,	1893
	Mitchell, Dr G. B., 1 Skinner Street, Whitby,	1893
	Moir, Dr Alex., 30 Buccleuch Place,	1876
255	Montgomery, Dr John, The Highlands, Balsall Heath, Birmingham,	1895
	Moore, Dr E. Coleman, 2 Coates Place,	1893
	Moorhouse, Dr J. Ernest, 9 Victoria Square, Stirling,	1892
	More, Dr James, Rothwell, Kettering, Northampton,	1880
	Morgan, Dr T. H., Gympie, Queensland, Australia,	1895
260	Morison, Dr Albert E., Brougham Terrace, Hartlepool,	1888
	Morris, Dr S. Glanville, Ffynondilo, Nantgaredig, South Wales,	1894
	Mowat, Dr John, 6 Buccleuch Place,	1884
	Munro, Dr A. Watson, 183 Liverpool Street, Sydney, Australia,	1892
	Murray, Dr A. Lang, 18 Duddingston Park, Portobello,	1889
265	Murray, Dr D. R., 41 Albany Street, Leith,	1878
	Murray, Dr James, 1 Brandon Street,	1879
	Murray, Dr R. Milne, 11 Chester Street,	1880
	Nairne, Dr J. Stuart, 141 Hill Street, Garnethill, Glasgow,	1889
	Napier, Dr A. D. L., The General Hospital, Adelaide, South Australia,	1878
270	Narayan, Mr Kumar B., Cooch Behar, India,	1888

		Date of Admission.
	Nesham, Dr T. Cargill, 12 Ellison Place, Newcastle-on-Tyne,	1885
	Nisbet, Dr W. B., Townsville, N. Queensland, Australia,	1886
	Oakes, Dr Arthur, "Warialda," Portarlington Road, Bournemouth,	1879
	Ogilvy, Dr Stewart Grant, 12 Graham Street,	1895
275	Oliphant, Dr E. H. Lawrence, 18 Burnbank Terrace, Glasgow,	1885
	Orr, Dr John, 6 Egerton Road, Monton, Manchester,	1887
	Orr, Dr W. Basil, 13 Braid Road,	1889
	Pairman, Dr T. Wyld, H.M. Prison, Lyttelton, New Zealand,	1883
	Paterson, Dr. G. Keppie, 17 Forth Street,	1882
280	Paterson, Dr G. W. Simla, 2 Glengyle Terrace,	1896
	Paterson, Dr William, Millbrae Road, Langside, Glasgow,	1890
	Peddie, Dr H. Anderson, 24 Palmerston Place,	1882
	Pereira, Dr A. A. Jervis, Surgeon to the Delagoa Bay Railway, Lourenço Marques, Delagoa Bay, South Africa,	1888
	Perigal, Dr A., New Barnet, Herts,	1887
285	Peters, Dr James A.,	1892
	Pirie, Dr John, 15 Ardmillan Terrace,	1888
	Playfair, Dr John, 5 Melville Crescent,	1873
	Poole, Dr T. D., Poulton-le-Fylde,	1890
	Porteous, Dr J. Lindsay, 83 Warburton Avenue, Yonkers, New York,	1875
290	Price, Dr A. W. Gordon, 9 Grange Road,	1890
	Price, Dr E. F. T., 1 Middleby Street,	1890
	Primrose, Dr Alex., 196 Simcoe Street, Toronto, Canada,	1887
	Pringle, Dr J. Hogarth, 172 Bath Street, Glasgow,	1886
	Proudfoot, Dr Thomas, 30 Lauriston Place,	1884
295	Puckle, Dr S. Hale, Bishop's Castle, Shropshire,	1885
	Ranking, Dr J. E., Tunbridge Wells,	1881
	Rattray, Dr A. M. T., Portobello,	1869
	Reid, Dr W. L., 7 Royal Crescent, Glasgow, W.,	1880
	Reid, Dr W. Spence, Oakley, Kirkcudbright,	1880
300	Rendell, Dr Herbert R., P.O. Box 606, St John's, Newfoundland,	1882
	Richardson, Dr William, 1 Belgrave Villas, Cotham Grove, Bristol,	1884
	Ritchie, Dr A. Brown, 117 Boston Street, Hulme, Manchester,	1892
	Ritchie, Dr D. W. L., 22 Charlotte Square,	1883
	Ritchie, Dr James, 22 Charlotte Square,	1880
305	Ritchie, Dr R. Peel, 1 Melville Crescent,	1861
	Roberton, Dr Ernest, Auckland, New Zealand,	1887
	Roberts, Dr Ernest T., 85 Skipton Road, Keighley,	1890
	Roberts, Dr R. W., Cattybrook Villa, Cwmavon, near Port Talbot, South Wales,	1894
	Robertson, Dr John A., Matjesfontein, Cape Colony, South Africa,	1892
310	Robertson, Dr Robert, 34 Raeburn Place,	1897
	Robertson, Dr W. B., St Anne's, Thurlow Park Road, West Dulwich, London, S.E.,	1870
	Robertson, Dr W. G. Aitchison, 26 Minto Street,	1889
	Robins, Dr H., Sav-la-Mar, Jamaica, W. I.,	1893
	Robinson, Dr H. Shapter, Talfourd House, 78 Peckham Road, Camberwell, London, S.E.,	1890
315	Robson, Dr B. S., 66 Brighton Grove, Newcastle-on-Tyne,	1887
	Ronalds, Dr Tennent, Killochan Castle, Girvan,	1887
	Ronaldson, Dr T. R., 3 Bruntsfield Terrace,	1877
	Rosa, Dr Albert F., 20 Dundonald Street,	1893
	Russell, Dr W., 3 Walker Street,	1890
320	Salmon, Dr C. Carty, "Newells," Toorak Road, South Yarra, Melbourne, Australia,	1891
	Sang, Dr J. E.,	1889
	Sapara, Dr Oguntola, Lagos, W. C. Africa,	1895

		Date of Admission.
	Saunders, Dr F. A., Grahamstown, Cape Colony, South Africa,	1885
	Schofield, Dr L. J., Warrensburg, Mo., U.S.A.,	1893
325	Scott, Dr T. R., Musselburgh,	1880
	Shaw, Dr W. J., Cockburnspath,	1892
	Shiels, Dr G. F., 229 Geary Street, San Francisco,	1887
	Simpson, Dr W. Petrie, Tattershall, Lincoln,	1892
	Sloan, Dr Allen T., 22 Forth Street,	1893
330	Sloan, Dr S., 5 Somerset Pl., Sauchiehall St. West, Glasgow,	1887
	Smart, Dr David, 74 Hartington Road, Sefton Park, Liverpool,	1882
	Smith, Dr G. H. Walton, Erang, Oxford St., Sydney, Australia,	1892
	Smith, Dr Gains T., Moncton, New Brunswick, Canada,	1891
	Smith, Dr James, 1 Parsonsgreen Terrace,	1891
335	Smith, Dr John, Brycehall, Kirkcaldy,	1885
	Smith, Dr J. Gordon, Akuse, Accra, Gold Coast, West Africa,	1892
	Smith, Dr William, 14 Hartington Gardens,	1890
	Smith, Dr W. Ramsay, The General Hospital, Adelaide, South Australia,	1892
	Sneddon, Dr William, Cupar-Fife,	1888
340	Somerville, Dr Robert, Galashiels,	1881
	Spalding, Dr William, Gorebridge,	1867
	Spence, Dr R., Burntisland,	1878
	Spence, Dr William, Dollar,	1884
	Stephen, Dr W. A., Loftus-in-Cleveland, Yorkshire,	1894
345	Stephenson, Dr W. H., 137 Rochdale Road, Harpurhey, Manchester,	1895
	Stevens, Dr John, 2 Shandon Street,	1894
	Stewart, Dr J. S., 15 Merchiston Place,	1884
	Stewart, Dr R., 42 George Square,	1885
	Stirling, Dr R., 4 Atholl Place, Perth,	1892
350	Stirling, Dr Stewart, 4 Coates Crescent,	1866
	Sturrock, Dr J. F., Arima, Broughty-Ferry,	1887
	Sym, Dr A. C., 144 Morningside Road,	1885
	Taylor, Dr David R., St Helen's, Ayton,	1896
	Taylor, Dr William, 12 Melville Street,	1868
355	Taylor, Dr W. Macrae, 12 Melville Street,	1895
	Teacher, Dr C., 16 Newington Road,	1887
	Temple, Dr G. H., 2 Sydenham Terrace, Weston-super-Mare,	1888
	Thatcher, Dr C. H., 8 Melville Crescent,	1877
	Thin, Dr Robert, 38 Albany Street,	1891
360	Thom, Dr Alexander, Viewfield, Crieff,	1884
	Thompson, Dr James L., Hospital for Insane, Ararat, Victoria, Australia,	1894
	Thomson, Dr A. D. R., Musselburgh,	1877
	Thomson, Dr James, David Place, Jersey,	1881
	Thomson, Dr John, 14 Coates Crescent,	1887
365	Thomson, Dr J. Stitt, The Mount, Lincoln,	1877
	Thyne, Dr T. J., 2 Dean Terrace,	1887
	Tod, Dr John, 93 Ferry Road, Leith,	1892
	Tristan, Dr R. J., 6 Chapelgate, Retford, Notts,	1887
	Underhill, Dr C. E., 8 Coates Crescent,	1872
370	Underhill, Dr Frederick T., Vancouvir, British Columbia,	1885
	Underhill, Dr T. Edgar, Dunedin, Barnt Green, Worcestershire,	1879
	Vassie, Dr Alexander H., 98 Priory Road, West Hampstead, London, N.W.,	1891
	Vickery, Dr W. H., 52 Elswick Road, Newcastle-on-Tyne,	1892
	Wade, Dr George, Melrose,	1893
375	Walker, Dr Andrew, Sandon House, Brunswick Street, Sheffield,	1893
	Walker, Dr A. Wallace, 24 Forth Street,	1886
	Wallace, Dr Abraham, 39 Harley Street, London, W.,	1879
	Watson, Dr Douglas C., 19 Rutland Street,	1897
	Watson, Dr P. H., 72 Jesmond Road, Newcastle-on-Tyne,	1887
380	Watson, Dr R. H., Burnlea, Bent Road, Hamilton,	1896

		Date of Admission.
	Waugh, Dr John, 36 Finsbury Pavement, London, E.C.,	1881
	Webster, Dr A. D., Belleville Lodge, S. Blacket Place,	1881
	Webster, Dr J. C., 287 Mountain Street, Montreal,	1889
	Welby, Dr Frederick E., Colonial Surgeon, St Helena,	1889
385	Whyte, Dr J. Curtis, Dalkeith,	1896
	Wilcockson, Dr G. Morton, 183 Southampton Street, Reading,	1893
	Wilkie, Dr James, Selville House, Portobello,	1897
	Wilkinson, Dr George, 109 Park Road, Liverpool,	1889
	Will, Dr Ogilvie, 379 Union Street, Aberdeen,	1867
390	Williams, Dr J. D., 20 Windsor Place, Cardiff,	1889
	Wilson, Dr James, 53 Inverleith Row,	1889
	Wilson, Dr T. D., 10 Newington Road,	1879
	Wise, Dr Robert, 5 Weston Park, Crouch End, London, N.,	1890
	Wood, Dr Russell, 9 Darnaway Street,	1880
395	Wood, Dr Thomas, 55 Ferry Road,	1886
	Wood, Dr William, 19 Roxburgh Street,	1892
	Wright, Dr W. F., Bonnington Mount, Bonnington Terrace,	1887
	Yoe, Dr Richard T., 2103 Floyd Street, Louisville, Kentucky, U.S.A.,	1891
	Young, Dr J. Y. Simpson, 8 Alva Street,	1891
400	Young, Dr Peter, 43 Heriot Row,	1859
	Young, Dr Peter A., 25 Manor Place,	1871
402	Young, Dr R. J. Erskine, 8 Alva Street,	1892

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TRANSACTIONS

OF THE

EDINBURGH OBSTETRICAL SOCIETY,

FOR SESSION LVIII., 1896-97.

MEETING I.—NOVEMBER 11, 1896.

Dr A. BALLANTYNE, *President, in the Chair.*

I. *The Treasurer* (*Dr W. Craig*) made his Annual Statement, which is given below:—

INCOME.

Balance from Session 1894-95,					£319	9 0
Arrears,	£5	1	0			
Bank Interest on Deposit Receipts,	1	11	0			
Interest on Consols,	6	15	4			
Entrance Fees from 14 new Ordinary Fellows,	14	14	0			
Annual Contributions from 354 Ordinary Fellows,	88	10	0			
Composition for Life-Membership from 4 Ordinary Fellows,	21	0	0			
					137	11 4
					£457	0 4

EXPENDITURE.

Janitor, Surgeons' Hall,	£0	5	0			
Commission to Collector,	1	5	6			
Stamped Envelopes,	3	4	1			
Doorkeeper's Salary, 9 Meetings,	1	2	6			
Carriage of Parcels, etc.,	0	1	10			
Oliver & Boyd's Account for Vol. XXI. of Society's Transactions (412 copies),	98	17	8			
Oliver & Boyd's Account for Printing Billets, Postages, etc.,	20	17	2			
Rent of Rooms at 5 St Andrew Square,	4	10	0			
Shorthand Reporter,	1	1	0			
Waterston & Sons' Accounts,	3	10	6			
The Secretaries for Postages,	0	12	0			
					£135	7 3
Balance to New Account,[1]					321	13 1
					£457	0 4

[1] Of this Balance the sum of £250, 10s. 6d. is invested in 2¾ per cent. Consols.

The Treasurer's Accounts were audited by Drs Church and Buist, and found correct, and on the motion of *Dr Brewis* a cordial vote of thanks was accorded to him by the Fellows of the Society.

II. The Editor of Transactions (*Dr J. W. Ballantyne*) then read his Annual Report, and presented the 21st volume of the Society's Transactions, containing a General Index of Subjects and Authors to the whole series of the Transactions. He pointed out that it was (even apart from the General Index) the largest single volume that had yet been published by the Society, and noted that it contained in full all the work done before the Society during the session, with the single exception of the report of the discussion on "Professional Secrecy *versus* Privilege in Obstetrics and Gynecology."

Prof. Simpson moved that the Society accord a special vote of thanks to the Editor of the Transactions for the pains he had taken with this new volume. No one who had not had to do with the compiling of an index could understand the amount of time and labour that Dr Ballantyne must have expended in preparing the splendid Index of the Society's twenty-one volumes with which the last of them was enriched. It would be a great boon to every obstetrician to be able to obtain so easily a reference to the vast amount of interesting material stored up in our Transactions, and the very existence of the Index added greatly to the value of the whole series of volumes.

The vote of thanks was seconded by *Dr Hart*, and accorded unanimously.

III. *Dr W. Craig* then made the following motion, which was seconded by *Dr J. W. Ballantyne*, and carried unanimously:—"The right of publishing any paper read before the Society remains in the hands of the Society, and MSS. of all communications which have been made to the Society shall be at once handed to the Editor of the Transactions for publication in the Transactions, in whole or in part, as the Council may determine. Authors may, however, allow their papers to appear elsewhere, provided that the publication of the Transactions is not thereby delayed."

IV. The Society then proceeded to the election of Office-bearers for the present session, and the President announced the result as follows:—*President*, Dr A. Ballantyne (Dalkeith); *Vice-Presidents*, (*Senior*) Prof. A. R. Simpson, (*Junior*) Dr R. Milne Murray; *Treasurer*, Dr Craig; *Secretaries*, Drs F. W. N. Haultain and J. Haig Ferguson; *Librarian*, Dr Milne Murray; *Editor of Transactions*, Dr J. W. Ballantyne; *Members of Council*, Dr A. H. F. Barbour, Dr James Ritchie, Dr Andrew Balfour (Portobello), Dr J. Jamieson, Dr J. B. Buist, Dr W. N. Elder, Dr Hamilton (Hawick), Dr Fraser Wright.

V. The following gentlemen were duly elected Ordinary Fellows of the Society:—Robert Gordon M'Kerron, M.A., M.B. C.M., 143 Union Street, Aberdeen; Donald G. Gordon Macdonald, M.D., 26 King Street, Aberdeen; F. J. M'Cann, M.B. C.M., 5 Curzon Street, Mayfair, London; and David R. Taylor, L.R.C.P. & S. E., Ayton, Berwickshire.

VI. *Dr F. W. N. Haultain* then proposed a cordial vote of thanks to the retiring Secretary (Dr J. W. Ballantyne), which was unanimously accorded, and suitably replied to by *Dr Ballantyne.*

VII. The resignations of Dr F. Reid Mackay and Mr Alexis Thomson were intimated and accepted.

VIII. CHLOROFORM IN MIDWIFERY PRACTICE.

By ALEXANDER BALLANTYNE, M.D., F.R.C.P. Ed., Dalkeith.

A YEAR has come and gone since you did me the great honour to place me in this Chair, and this lapse of time has only deepened my sense of your kindness, while it has made me more alive to the fact that my past life and training have done little to fit me for it.

A country practitioner has seldom any opportunity to do more than attend to the work that lies before him in his daily life. In nothing, perhaps, does he feel this more than when, called upon to write an Address such as this, he becomes aware that the facility in writing he may once have had when he left college is gone, and that no amount of ink used now can make up for the neglect of the pen in years gone by. This knowledge increases in no small degree the diffidence I feel in treating a subject which has for the past few weeks been the theme of many an accomplished writer in the medical press. But the deep and abiding interest this Society must ever have in anæsthesia, with the infancy at least of which it is so intimately associated, would be unpardonably ignored were the occupant of this Chair to hail its jubilee with only a passing notice.

In the abstract of the proceedings of this Society in its session 1846-47, we read:—"On the evening of Wednesday, January 20, 1847—Dr Simpson, President, in the Chair. After the Society had agreed that in future regular abstracts of its proceedings should be published in the *Monthly Journal of Medical Science,* Dr Simpson related a case of turning under the influence of sulphuric ether, and proposed substitution of turning for craniotomy in cases of detention of the child's head at the brim of the pelvis." It adds:—"Dr Simpson showed the child which he had on the preceding evening extracted by turning while the mother was insensible from the use of sulphuric ether." On that evening also Dr Simpson showed several instruments, such as pessaries, etc., which he had

made of gutta-percha, and how easily and speedily they could be fashioned, by dipping them in boiling water, to suit any particular case. On that most memorable night he—1st, Gave to the world the priceless boon of painless childbirth; 2nd, described a method of saving the child with greater safety to the mother in cases of the slighter forms of disproportion between the head of the child and pelvic brim; and, 3rd, explained the use of gutta-percha (then comparatively little known) in making various contrivances useful in the treatment of diseases of women. This simple extract speaks for itself, and shows the manner of man who occupied this Chair fifty years ago. This by the way. At the next meeting (February 10th), "Dr Simpson continued his report of cases in which he had employed ether during labour." From these cases he inferred:—1st, That the inhalation of ether procured for the person a more or less perfect freedom from the conscious pain and suffering attendant upon labour; 2nd, that it did not, however, diminish the strength and regularity of the contractions of the uterus; 3rd, that, on the other hand, it apparently (more especially when combined with ergot) sometimes increased them in severity and number; 4th, that the contraction of the uterus after delivery seemed perfect and healthy when it was administered; 5th, that the reflex assistant contraction of the abdominal muscles, etc., was apparently more easily called into action by artificial irritation and pressure on the vagina, etc., when the patient was in an etherised state; 6th, that its employment might not only save the mother from mere pain in the last stage of labour, but might probably save her also, in some degree, from the occurrence and consequences of *nervous shock* attendant upon delivery, and thereby reduce the danger and fatality of childbed; and, 7th, its exhibition did not seem to be injurious to the child. In exactly three weeks from his first case he gave us the result of his observations, which, in all essential particulars, has been fully sustained during the past fifty years. A few months before this, Morton had, as everybody knows, demonstrated beyond the power of contradiction the ever-blessed truth that ether could wrap mankind in complete unconsciousness, and banish the pain in severe operations. Soon the discovery became the property of the civilised world, but, like all innovations, was the cause of bitter feud, and nowhere more so than in America. Very many surgeons, however, notably in America and Great Britain, warmly accepted and gratefully used it, but its opponents were numerous and fiercely hostile, even asserting that the pain of an operation was a useful stimulant to the patient. To Simpson, ever on the alert to save human suffering, anæsthesia came as a revelation. None saw more quickly or more completely than he its far-reaching application to all kinds of pain, and, as we have seen, he tried it in labour on the 19th January. The case was admirably chosen. No one could tell whether uterine

contraction as well as pain might be abolished, but in such a case as turning, the more the anæsthetic controlled and minimised uterine contraction the better it suited his purpose. His success was so complete that he felt justified in using ether to annul the pain in normal labour. Unsatisfied with ether, he tried many other anæsthetics, till in November 1847 he introduced chloroform as a more potent, portable, and pleasant anæsthetic.

The opposition to anæsthesia in midwifery here and there manifested in and outside the profession *culminated* upon the use of chloroform. Nothing could have been more serviceable to a man like Simpson. Had the happy thought which struck Horace Wells, when he saw a man under the influence of nitrous oxide "break his shins" upon a bench without feeling the pain, that he had made a great discovery, occurred to a man like Simpson, anæsthesia would doubtless have been antedated two years. Possessed of great and varied mental powers, of inexhaustible energy, of quick and retentive memory, versatile and ever vigilant, ingenious in argument, a born controversialist, fortunately without a judicial mind, and great among many great obstetricians, he became the greatest apostle of anæsthesia. In his firm hand anæsthesia, like the torch of truth, shone the brighter the more it was shaken by adverse influences. How he toiled for it, wrote for it, and spoke for it unceasingly, sacrificing time and means for it, are matters of history well known to us all. Doubtless by his defence alone, anæsthesia in labour was quickly popularised and advanced many years. And those of us, his old pupils, who can so easily recall his marked personality, his little tricks of persuasive gesture and expression, his *suaviter in modo* and *fortiter in re*, and who loved him for his kindness and his sympathy, and for the power of fight that was in him, rejoice that before he passed to where there is no more pain, his great, kind heart had the abiding satisfaction that the battle-fields he had done so much to win were, after the lapse of years, covered with an ever-increasing verdure of perpetual blessing to suffering womanhood. But it has been said, with what amount of truth we shall endeavour to ascertain, that anæsthesia in child-bed is not an unmixed blessing to maternity, and is even fraught with death. Simpson, after the many experiments he had made upon himself and his famous co-workers, never seemed to anticipate any untoward effects from chloroform narcosis, and even gave it freely to his most intimate friends; and in looking over the details of his first cases one is struck with the length and fulness of its exhibition. Generally, it was continued till after the placenta was expelled, and then so deeply was the patient under its influence that her clothes could be changed and she lifted into another bed before being aware of what had happened.

Simpson substituted chloroform for ether, and administered it first on the 8th November 1847. His complete success led

many others to use and acknowledge its superiority. Others, however, were most violent in their opposition, and all kinds of objections were taken to its use. Among the many, perhaps, no opponent seems more amusing to us nowadays than Dr Gream, a most fashionable London physician. After speaking of etherisation as an unjustifiable act, which no excuse can palliate, he expresses the hope that none will hereafter be "Like him that knew not poison's power to kill until, by tasting it himself, was slain." And when death was not in the pot, other things worse than death were to be found. Speaking of the stage of excitement he does not hesitate to assert that if women (Englishwomen) were put in possession, as they ought to be, of what the ideas of a dreaming kind consist in many instances, and what were the voluntary efforts in accordance with them, they would, I believe, suffer death itself before they would subject themselves to the shadow of a chance of exhibitions such as have been recorded; and quoting Dr Tyler Smith, he says it has been reserved for the phenomena of etherisation (which term was used even after the introduction of chloroform) to show that as regards these sensations the human female may approach to the level of the brute creation. Chastity of feeling, and, above all, emotional self-control, are of far more importance than insensibility to pain. One patient had his hand paralysed, another his leg. And he is particularly severe on Dr Simpson, because he says:—"Whatever means or mode of etherisation is adopted, the most important of the conditions required for procuring a satisfactory and successful result from its employment in surgery consists in obstinately determining to avoid the commencement of the operation itself, and never venturing to apply the knife until the patient is under the full influence of the ether vapour, *and thoroughly and indubitably soporised by it.*" From which it plainly appears that Gream knew nothing about anæsthetics, and that Simpson had, so early in their administration, recognised one of the chief elements of safety in surgical anæsthesia. But more serious accusations were made, among which it was asserted that there was an increase of mortality in the lying-in hospitals of Edinburgh and Dublin after the introduction of chloroform, which was, however, fully disproved by Carmichael and Sinclair.

But the objectors and objections are too many to be recorded here. They were of all kinds,—moral, as we have seen, theological, physiological, and pathological; but the advance of anæsthesia in labour under the guidance of Simpson was decided and general. The death of Hannah Greenen of Winlaton, near Newcastle, for the removal of a toe-nail under chloroform early in 1848, had given check in a certain degree to its progress. Up to May 1848, according to Reeve, ether and chloroform had been given in about 2000 cases without death or any deleterious consequences, and a committee on obstetrics, appointed in 1848 by the American

Medical Association, found anæsthesia in labour both efficient and safe, adding that, in some respects, it was better adapted for midwifery than general surgery. But while in America and this country chloroform was largely given in normal labour, France and even Germany to a great extent practically rejected it. Nor is it easy to explain this opposition to, or at least apathy in, giving anæsthetics in natural labour. It had been urged, in addition to many fanciful objections from France, that it lengthens the duration of labour, that it increases the frequency of perineal rupture, and predisposes to post-partum hæmorrhage. Be that as it may, no plea was laid that it ever had any more serious effect or had been in any case fatal.

The frequency of death presumably from chloroform in surgical anæsthesia led the Royal Medical Chirurgical Society to appoint a commission of inquiry, who submitted their report in 1864. This report, which included cases of death from 1848 to 1860, states that there is no well-authenticated instance of sudden death recorded, either in this country or abroad, as occurring from its administration in labour when such administration had been conducted by a qualified medical man, and says, further, that as a rule it has no such ill effects on the nervous or vascular systems of the mother as to retard her convalescence, or render her more liable to any form of puerperal disease. Many physicians believe that it rather favours subsequent convalescence; a small minority hold a contrary opinion. The committee further gave the following rules:—1st, Avoid giving it after a full meal; 2nd, in primiparæ especially give it very moderately; 3rd, dilute well with air, and watch the pulse and breathing; 4th, keep your finger constantly on the pulse, and the moment it fails discontinue the chloroform; 5th, give it slowly; 6th, if depressed, give an occasional stimulant; 7th, when the head presses on the perineum give it more freely, to *promote relaxation;* 8th, in excitable persons, unless it acts well, it is better not to use it; 9th, always suspend its administration towards the end of labour; 12th, give it slowly, and if it causes delirious excitement, withhold it; 13th, in ordinary cases administer only as much as will render the patient indifferent to pain rather than unconscious of it, and give a little brandy at intervals. Whether we think these rules imperative or not, they show that the committee went very fully into the question of anæsthetics in labour, and that they express a most trustworthy consensus of opinion in this country, at least up to the end of 1860—that is thirteen years after anæsthesia was first used by Simpson. At that time the question of death under anæsthetics in labour was treated as settled. There had been no fatal cases, no mishap even, either in this country or abroad. Subsequent to this a committee appointed by the British Medical Association made a report on deaths occurring in the United Kingdom during the eleven years 1870-80. In all 112

cases were collected, and in not a single instance did death occur from its administration in midwifery. The American and Continental records, so far as the literature of these countries can be got at, have been productive of no evidence of the fatal effect of chloroform in labour, except one case to be hereafter noticed, while its complete safety has been times without number vindicated, and the individual evidence of its perfect safety is quite overwhelming. Conspicuous among hundreds is the written evidence of Dr Lombe Atthill in this country, and that of Dr J. C. Reeve and Dr Fordyce Barker in America.

Dr Atthill states that in 15,000 patients in the Rotunda chloroform was given when necessary, and was used by himself in over 3000 cases, "and amongst them all there was never *once* cause for alarm, much less did a death occur." But even more valuable is the evidence of Dr Fordyce Barker. Writing in 1887, he says:—"I have long regarded chloroform as the best and safest anæsthetic in obstetrics, and since 1850 have used no other. During the past thirty-seven years I have rarely attended a woman in confinement without the use of chloroform—never where she has suffered considerable pain. Having thus used it in several thousand cases, I unhesitatingly assert that not in a single case have I ever found reason to regret its use. In addition to my own experience I have carefully watched for all that has been published on this subject, and I am fully in accord with an eminent authority on obstetric anæsthesia, Dr J. B. Reeve, in his assertion that 'the most rigid scrutiny, inspired by hostility, has failed to show that when judiciously used it exerts any injurious influence on the mother or child.' Chloroform has been used in natural labour many hundred thousands of times, yet but a single case of death is on record when it was administered by a competent medical man, and in this case there is lack of post-mortem confirmation." "I would add," says Fordyce Barker, "that in this instance the death was preceded by a convulsion." Moreover, to bring the matter quite up to date, as it were, so far as individual testimony of a special kind in Edinburgh could easily be got at, I had kind replies to a letter of inquiry from our two Vice-Presidents, Prof. Simpson and Dr Croom, and also from Drs Moir, Underhill, Berry Hart, Milne Murray, and Barbour, and with the exception of Dr Milne Murray they gave most positive evidence that, when given by a medical man, they have never seen symptoms of danger, much less death, arise from its administration in labour. Dr F. B. Earle, in the *Chicago Clinical Review*, April 1896, says chloroform is safer to the parturient woman than in any other condition. It diminishes shock and destroys dread of future labours. Uterine inertia not more frequent, labour not prolonged, puerperium unaffected, invaluable in normal labour, absolutely necessary in obstetric operations. Such testimony, though perhaps none of so much

individual value, could be cited *ad nauseam*, from nearly all writers on obstetrics and on anæsthesia. Indeed, so far as I know, the authors of books on anæsthesia are unanimous in the opinion that chloroform is the best anæsthetic in labour, and that the immunity from danger is special and almost complete. Even B. C. Hirst, while writing in favour of ether in labour, contradicts a statement that chloroform is dangerous "as a dogmatic assertion which is scarcely justified in view of the fact that by far the larger part of the civilised world used chloroform *exclusively*." In Germany, France (though there seldom used in normal labour, notwithstanding that Lataud proclaims that no authentic fact exists which could cause us to doubt the immunity from danger in obstetric chloroformisation), Italy, and, indeed, Europe generally, it is almost solely used in obstetrics, and no death has been noted. But to descend from the illustrious testimony of great authorities to that of the more humble general practitioner in country practice, who, I trust, will not think it presumptuous in me to represent, chloroform is to him the only available anæsthetic. Brought up as many were at the feet of Simpson and Syme, and trained in the use of chloroform under one or other of the surgical teachers, and frequently giving it, fortune led me to country practice.

Frequently called to cases of labour at great distances from headquarters, I jumped into the saddle provided with a six-ounce bottle full of chloroform, some ergot, a pair of Simpson's forceps, and a catheter (I speak of more than thirty years ago, before the days of antiseptics); I felt ready for any of the usual varieties of labour. I had many hundred times the opportunity of giving chloroform during all the stages of labour. Prevented by distance from leaving a case once fairly begun, I had nothing to do but watch the progress of events, and it became an object of interest to observe narrowly the effect of chloroform in labour. I gave it unhesitatingly, with perfect confidence, and generally freely. The result invariably justified its exhibition. In turning and in long and short forceps cases, undertaken single-handed, very often without a nurse to help, I have never seen an approach to any sign of danger. Associated with others, also, in the more serious obstetric operations involving the destruction of the child, my experience has been the same. So situated, no other anæsthetic would have been serviceable; potent and portable, safe and often necessary, it was the greatest possible boon to practitioner and patient. As an analgesic, as a controller of voluntary effort, and as a minimiser of uterine contraction, it always answered perfectly. Such was and is still my experience, and such, I think, must be the experience of hundreds, if not of thousands, of my country brethren. Of city practice and of that of large towns I cannot of my own knowledge speak, but I have no doubt it has the same story to tell.

This overwhelming mass of evidence from repeated commissions of inquiry, from great authorities in obstetrics, from authors on anæsthetics, and from private practitioners, naturally leads us to approach the reported cases of death and danger from anæsthetics in labour with something akin to doubt; and even these, so far as is known, can almost be counted on one's fingers. The details of these cases, very interesting as they are,—albeit, however, generally very insufficient and unsatisfactory,—cannot, from the want of time, be gone into to-night.

Of deaths there are eight. In two only is it stated that a post-mortem was made, of which one had general emphysema of lungs, the other fatty degeneration of the heart. Of all organic diseases, I can conceive of none theoretically more likely to lead to accident in anæsthesia than emphysema. Here a stored up, fatally poisonous dose might act when given even by a competent administrator, and this case certainly conveys a useful caution. That by the way. The other we may rightly infer was the fatal issue of heart disease, determined probably by the strain of labour, in spite of the conserving power of chloroform. In a third case, that already mentioned by Reeve and Fordyce Barker, and in which there was no post-mortem, Reeve remarks (I think with truth, after reading the history of the case) the symptoms point strongly to embolism of the pulmonary artery. In the *Lancet* Commission, from which seven of the eight fatal cases are taken, there are two cases thought worthy of remark by the compiler. No. 320—Labour: Tremor occurred, pulse ceased, and patient was dead. No. 321—Labour: As patient did not rouse after inhalation, surgeon called in, who found a thready pulse, face blue, respiration imperfect; in ten minutes patient died. Then follows the remark, which has been repeated more than once by writers on anæsthetics,—patients in labour do not enjoy the absolute immunity from the pernicious effects of chloroform. Both patients were free from cardiac and pulmonary complications. No post-mortem. How did he know? And upon what slender grounds does he make the accusation against the pernicious effects of chloroform!

The other three cases reported by the *Lancet* Commission are equally unsatisfactory, as is shown in the short report of one of them in private practice. Patient aged 30; puerperal convulsions; no particulars. Can we possibly accept this as a case of death from chloroform in labour? I think not. The last two cases, though more fully reported, are equally unconvincing. Besides, sudden death in labour with no anæsthetic is not infrequent, and it may be a question how far the administration of chloroform prevents them.

But the advocate for a complete immunity from danger in administering chloroform in labour has also to consider the untoward results arising from the inhalation of the agent. There are about a dozen on record; five of these are available. As

the reports are comparatively short, I shall give them as printed. The first one, taken from French practice, and narrated by Reeve, is the most clearly reported.

Patient aged 21; primipara, at full term; presenting all the appearance of excellent health. At 10 A.M. chloroform, first as an analgesic, later to narcotism. From the first inspirations respiration very irregular, sometimes fast, sometimes slow; under deeper influence it became regular. At noon chloroform withdrawn; resumed at 1 o'clock. The patient went promptly to sleep without excitement, when at 1.15, the compress being nearly dry, she slowly ceased to breathe without falling back of the tongue. The face, especially the lips and eyelids, became livid, then respiration and circulation ceased entirely. The head of the patient was promptly lowered, and mouth-to-mouth artificial respiration begun. At the end of a minute and a half an *expiration* without closure of glottis (could that be?) occurred, soon after an inspiration, and at the end of two minutes more respiration was established. Child alive. Convalescence normal.

The other four cases are all to be found in the *Lancet's* Clinical Report upon Chloroform. No. 83—Chloroform given to relax uterus to aid version. Pulse and respiration failed simultaneously. Symptoms—Ceased breathing, became pulseless: with difficulty resuscitated, and slightest inspiration of chloroform reproduced alarming symptoms. Strong, healthy; free from heart or lung affection. No. 84—After six deep inspirations, ceased breathing; restored by Marshall Hall method. No. 85—Chloroform, small dose; breathing ceased; restored by Marshall Hall method. Both Nos. 84 and 85 were free from cardiac and pulmonary complications. The last is No. 35, from records of private practice. Removal of dead fœtus (two minutes); respiration failed first; inversion successfully practised; patient fat, with granular kidneys.

In considering these cases it must be borne in mind that we have no proof, though it may be presumed, that the chloroform was administered by a competent person. It has over and over again happened that danger has arisen from entrusting the inhalation to a nurse or incompetent person. Thus in one of Lusk's cases there was gross mal-administration, even admitted by him, and yet he says that such a case showed that there was no absolute safety in giving chloroform. He might as well have said that it proved that chloroform might possibly kill a person. And no one doubts chloroform, administered with complete recklessness, can easily do so. Again, to deny to chloroform what we allow to every potent drug in the Pharmacopœia, that minute doses act with intense activity on some people from idiosyncrasy of the person, would be as unfair as it is absurd. Thus I have seen 25 drops of laudanum in an adult cause most alarming symptoms; but it has never prevented me asserting

that 25 drops of laudanum is a perfectly safe dose for an adult. Then still further, there is the possibility of impurity of the drug. It is well known impure chloroform—that is to say, chloroform mixed with the residue—increases pulse-rate, decreases blood-pressure, and stops respiration much more quickly than the pure drug. Impure chloroform is not infrequently met with abroad, and even when pure it, as we all know, decomposes in strong sunlight, and in gaslight produces, by decomposition, phosgene gas, the action of which, beyond its irritating effects, is not known. Hewit says that in regard to the impurities "our knowledge is at present very imperfect, and there is room for further investigation." All these things therefore require to be taken into account, as well as a possible explanation of the symptoms from other temporary conditions of the system, before we can charge chloroform with the full responsibility of producing the untoward and dangerous symptoms above recorded. Yet another proof of the unsusceptibility to the pernicious effect of chloroform which the woman in labour enjoys is to be found not only in the difference there is in the manner of its administration in obstetrics as contrasted with surgery, but also in the way the patient takes it and is affected by it. Anyone who has had much experience in the giving of chloroform in surgery and in labour must have frequently noticed the difference. The way we give chloroform seems often to set at defiance many rules considered necessary for its safe administration in surgery. In surgery we prepare the patient for chloroform and give no food; we are anxious to get over as quickly as possible all the stages of its action till we reach complete narcosis, because most fatal results may happen before that condition is reached. We are specially warned against a slight intermitting anæsthesia. In this connexion it is interesting to note that Hewit remarks that in surgical operations upon the genito-urinary organs a very profound anæsthesia is necessary. Reflex phenomena, such as loud-crowing inspiration, "hesitating" expiration, general muscular rigidity, etc., are more prone to make their appearance. The patient should never be touched by the surgeon till stertor, relaxation, and other signs of deep narcosis are present. That when pain occurs or is inflicted during semi-anæsthesia we greatly jeopardise the patient, and that great muscular exertion is often succeeded by a rapid and fatal inhalation. All these observations are the result of experience, and to many physiology furnishes the reason annexed. But what do we do in labour? We arrive at the bedside of our patient. She desires chloroform. We never hesitate. We do not know whether she has had food or whether she has been sick. We give it in defiance of surgical rule—slightly, intermittingly, and frequently. A pain comes on when she may be in a state of semi-anæsthesia; it gives us no concern; we give a little more or not, and the amount and the effect, except as regards the pain which our patient suffers, never for a moment occupy our

minds. We abstain from giving it except during the pain, not because we are afraid of prolonged administration, but lest the labour should be prolonged. In fact, we constantly give it, even to deepest narcosis, as if there were no possibility of danger. Speaking from my own experience, I am never without the feeling that an accident may happen from the chloroform in surgical operations: in labour never. Besides, the patient behaves quite differently during its exhibition. She takes it quietly; there is no struggle, no sickness—indeed, the sickness of labour seems to be stopped by it—and she slips quickly into unconsciousness, as a child does when we give chloroform, and as rapidly comes out of it.

Dr Lombe Atthill, in 1892, after saying that he is unable to say why chloroform should be so safe in labour, suggests that "possibly because in these cases the involuntary expulsive efforts seldom entirely cease, and as at the expiration of each of these comparatively deep inspiration follows, it may tend to prevent asphyxia, but then the deeper the inspiration the more chloroform will be inhaled; and one would suppose the danger would be greater of an overdose being then taken."

The practically complete immunity from danger and death which the parturient woman enjoys being, I think, established, what reasons can be assigned for it? Reeve, than whom no writer of late years on anæsthesia in labour has been more full and satisfactory, gives the following reasons:—1*st*, Sex, because fatal effects from giving chloroform are at least twice as frequent in men than women. 2*nd*, Recumbent position. 3*rd*, Elimination of emotion; patient has no fear, only seeking relief from pain. 4*th*, Existence of pain as a source of safety, in support of which he states, what has been proved, that deaths from chloroform are much less frequent in military than civil surgery. Some hold that the increased size of the heart in those in labour accounts for it; while others assert that such an idea is quite erroneous, inasmuch as the best subjects for chloroform are those whose vital powers are low, and the worst those who are in robust health with vigorously working hearts. But any or all of these explanations do not, to my mind, fully account for it; and I am persuaded that it must rest on a more purely physiological basis, and can be better explained from the consideration—1*st*, of the pharmacological action of chloroform; 2*nd*, of the physiological condition of the woman in labour; and, finally, the action of chloroform on this *modified* physiological state.

I need scarcely remind you that the pharmacological actions of chloroform are—1*st*, Increased, then suspended, sensation; 2*nd*, suspended reflex action; 3*rd*, paralysis of the vasomotor centre, with, what is of the greatest importance in this connexion, a concomitant fall of the general blood-pressure; 4*th*, paralysis of the respiratory centre and slowing respiration; and, 5*th*, paralysis of cardiac ganglia.

The modifications in the physiological conditions of the parturient woman which are important in this relation are—1*st*, general increase of vascular tension, which occurs even early in pregnancy; 2*nd*, increase in the total mass of blood in the system during the second half of gestation; and, 3*rd*, eccentric hypertrophy of the heart.

In active labour the chief phenomena are—Intermitting muscular action of uterus, abdominal muscles, and diaphragm, with consequent compression of the bloodvessels in the abdomen; an accelerated pulse-rate; forced expiration and increased costal breathing, resulting in a permanently high blood-pressure with an intermitting increase of it during the pains, and a higher standard of activity in the inspiratory centre.

The action of chloroform on this *modified* physiological condition, as contrasted with that when given in the *ordinary* physiological state, is that the blood-pressure is not dangerously reduced from its being set at such a high level, and the respiratory centre is not easily paralysed, because of the augmented activity from the stimulation of more forcible respiratory movements.

It is well known to us all how shallow the respiration may become, and how often it tends to stop in surgical anæsthesia; but in obstetrical anæsthesia this is prevented by the physiological "artificial respiration," if such a phrase can possibly be permitted, which recurs with each pain.

During a pain the rapid action of chloroform is quickly recovered from by the forced expiration, and the nerve-centres, temporarily stimulated by the increased respiration, resist the effect of the depressing agent, while the general high blood-pressure furnishes a reserve power of resistance against any untoward effect or excessive amount of the anæsthetic. Moreover, it has been affirmed, and recently corroborated, that in cases of chloroform toxemia, when respiration has ceased, rapid dilatation of the sphincter ani stimulates the respiratory centre and re-establishes respiration. May not the forcible dilatation of the vagina and external parts in labour act as a constantly-recurring stimulus to this centre, and so lessen the danger of its paralysis when chloroform is most deeply given and most rapidly inhaled? The action of chloroform on these modified physiological conditions, and perhaps the forcible dilatation of the maternal parts, furnish to my mind a much more satisfactory reason for the completely safe effect of chloroform in labour and for the manner in which it is taken than has hitherto been adduced.

But chloroform is not only anæsthetic in labour, it is also life-preserving. All acknowledge it prevents shock and lessens exhaustion in obstetric operations and long labours. It prevents the many dangers which arise from contracted and brittle blood-vessels. It conserves the vital powers, and by controlling muscular action and minimising blood-pressure in heart disease, has

saved many lives, as Dr Angus MacDonald, Dr Fordyce Barker, and others have shown. In relation to this, Dr MacDonald, in his book on the Bearings of Chronic Disease of the Heart upon Pregnancy, Parturition, and Childhood, specially mentions at least two cases —in one of which, though he feared to give chloroform, as there was aortic insufficiency and mitral obstruction, he found "the pulse became stronger and steadier during its administration." In the other, a case of mitral stenosis reported by Dr Playfair, Dr MacDonald administered chloroform, "which steadied and strengthened the pulse." Dr MacDonald contends that there is a high arterial pressure during labour (and even a relatively higher arterial pressure afterwards), and that this pressure is dangerously increased during the occurrence of pain, but, so far as I have seen, he does not state that chloroform, by its pharmacological action on blood-pressure, lessens this danger. Dr Fordyce Barker gives a graphic account of the effects of chloroform in a case of mitral insufficiency so early as 1853. The patient was, when seen, regarded by him as perfectly hopeless, and he proposed chloroform solely with the hope of euthanasia. He gave it till she became unconscious during the pains. Gradually her pulse became regular and stronger, and dropped to 96 in a minute, which before the chloroform was given could not be counted. She rallied, and made a good convalescence. In a subsequent labour she was again safely delivered under chloroform by forceps. Indeed, testimony on the good effects of chloroform in such cases is unanimous. It is in labour what Dr Julian J. Chisholm says concerning it in surgery, "the strong bridge which will conduct patients suffering from serious heart disease safely over serious operations."

Are there any contra-indications to its use?

Theoretically, for I have no personal knowledge, I should say in cases of general emphysema of the lungs, on account of the possibilities of overdosage before any apparent untoward effect can be seen. Should it be necessary in such a condition to give chloroform for obstetric operation, it would be well to bear in mind that the chloroform may continue to act after the inhalation is stopped.

Again, cases of great and rapid losses of blood, which, as we know, rapidly lower blood-pressure, call for great caution in its administration, if not the substitution of ether.

In this brief and very incomplete sketch of the history of anæsthesia in labour, I have not mentioned ether since I spoke of it as having been abandoned by Simpson till now. In some places, especially in America, it has become again the fashion to resort to ether as an anæsthetic in labour. To my mind, though I desire to speak with great diffidence, never having seen it used, the objections to ether are numerous. It is much less pleasant; it is more difficult to administer; it requires a larger quantity; it is slower in action (a grave fault in midwifery); it increases the action of the heart and respiration when it is already rapid. It does not

appreciably diminish blood-pressure, except when in its exhibitions there is total exclusion of air and approaching asphyxia. It increases arterial tension and venous congestion when they are everywhere present. It is directly contra-indicated in some forms of heart disease, in all cases of contracted and diseased blood-vessels, and in affections of the lungs and kidneys. It is said to cause vomiting more frequently than chloroform, not only in going under but also in recovering from its action; and, lastly, because, according to Hirst, it delays the secretion of milk for twenty-four to forty-eight hours, and renders it unsuitable for the infant during the first week. On the other hand, it may, and probably is, of service in extremely exhausted conditions of the system, and where, as I have already mentioned, there has been a great and rapid loss of blood, causing a low blood-pressure. Wherever ether has been used instead of chloroform it has been on account of its alleged greater safety, but this has never been shown; for while much less frequently given, it also has been charged with causing dangerous symptoms, and even death.

A review of the whole history of anæsthesia in labour shows that never in the annals of medicine has there been so much contention and misrepresentation, such collecting and sifting of evidence, and ultimately such complete victory for those favourable to the use of anæsthesia in normal and abnormal labour.

Never has a medicinal agent been subjected to so much criticism and investigation at the hands of commissions, scientific investigators, and medical practitioners as chloroform, and surely never has a potent drug been so carelessly used or so frequently mal-administered. And still it holds the field against all other anæsthetics in labour. Ether, ethidine, ethyl nitrate, ethyl bromide, olefiant gas, and others have been vaunted as superior, but none have found such favour, while some have been proved distinctly dangerous.

From all which we may confidently conclude that chloroform anæsthesia is, and will probably continue to be, the best means not only to annul pain, but to preserve life in the ordeal of child-bearing. But the experience and teaching of so many years do not end here. With a happy ignorance of possible danger, chloroform was at first given with a freeness, if not indeed recklessness, not warranted in the use of so potent an agent, and never was the flower safely plucked so often from the nettle and dangers as in these early years. Again and again rules were given for its proper administration. Time does not allow the consideration of them here. But these general deductions may, I think, be drawn from this long period of experience:—

1*st*, That in obstetric practice the simpler the method of administration the better. The method is secondary, the care and watchfulness of the administrator all-important. 2*nd*, That the best diluent still is air; that the amount of chloroform poured

upon a towel or inhaler is of little moment, provided always that air is at first freely admitted, and that the effect of the drug upon the person is closely observed. *3rd*, That attention should be persistently directed to the respiration. *4th*, That in normal labour chloroform should be given only during a pain, till the head is on the perineum, and then to full unconsciousness. *5th*, That after the birth of the head chloroform should usually be stopped.

Again, *1st*, That we are always justified in giving chloroform in normal labour, and should offer it. *2nd*, That it is our duty to do so in all cases of severe labour and in all cases of operative interference. *3rd*, That in all diseases of the heart, and in all diseased conditions of the bloodvessels, the careful administration of chloroform is beneficial and often necessary to save life. *4th*, That in general emphysema of the lungs the greatest care and watchfulness should be exercised in giving chloroform, and that in conditions of great exhaustion and after great rapid and recent losses of blood, as in placenta prævia, extreme caution is necessary, and possibly the substitution of ether.

In bringing this Address to a close, I trust that you will agree with me that the trend of evidence—from the beginning of chloroform anæsthesia in labour till now—most clearly indicates a practically complete immunity from danger and death, and that the various physiological conditions of the parturient woman confer upon her special protection against the dangers of chloroform anæsthesia.

Gentlemen,—It remains for me only to thank you for your kind attention to this Address.

On the motion of *Prof. Simpson*, seconded by *Dr Berry Hart*, the President was awarded a very hearty vote of thanks.

Prof. Simpson thought the Society could not proceed to the hearing of the first paper without expressing to the President the pleasure with which they had listened to his extremely interesting Inaugural Address. The subject had been very aptly chosen, and dealt with in a masterly style. The Society must necessarily always be deeply interested in the question of the use of anæsthetics in midwifery, and all its members would be found to be in agreement with the President in his practical conclusions.

VIII. TRANSVERSE SEPTAL ATRESIA OF THE LOWER THIRD OF THE GENITAL TRACT.

By D. Berry Hart, M.D., F.R.C.P.E., Lecturer on Midwifery and Diseases of Women, School of the Royal Colleges (Surgeons' Hall), Edinburgh.

The usually accepted form, and by far the simplest, of atresia vaginæ is that known as atresia hymenalis. Here the hymeneal opening has not formed, the menstrual blood is dammed back, and when an incision is made through the septum a large quantity of chocolate-like blood escapes. The genital organs in such cases may be otherwise normal.

A few rare instances have been recorded where the occluding septum was higher up than the ordinary site of the hymen, and such anomalous cases have been usually regarded as double hymen, or as due to inflammatory adhesions. Such instances deserve, however, very careful scrutiny, as they are opposed to ordinary developmental views, and, instead of being brushed aside, they must be fairly met and explained if possible. What are often termed anomalies are really proofs of the erroneous nature of current explanations.

I have had under my care three cases of atresia hymenalis, all in private practice. Of these I describe only two as types.

The first case to be recorded occurred in the practice of Dr James Smith. There was the usual bulging membrane at the site of the hymen, and on rectal examination one could feel the vaginal distention. With all antiseptic precautions the hymen was freely incised, the blood allowed to evacuate slowly, and then, as the uterus was not involved in the distention, the vagina washed out and plugged with iodoform gauze. The recovery was complete, and no further trouble was experienced.

The second case was one of the rare anomalous forms, and requires special record. It occurred in the practice of Dr MacGibbon, and was also seen at first, and in my absence, by Dr Fordyce. When seen by them on Sept. 20th, the girl, aged 14, was suffering from retention of urine, and the history was that she had never menstruated, had had pain in the back for a few days previous to this occasion, and also a month before. On examination by inspection, a tumour was noted projecting at the hymen when the labia majora were separated. The urine was drawn off, and this urgent symptom relieved.

When I saw her soon afterwards the septum had ruptured and a large amount of the characteristic blood escaped.

On examination I then found a very unusual condition. The external genitals and hymen were normal, but on passing my finger through the vaginal orifice I felt a transverse septum an inch from the hymen and with a laceration on the left side. A

week afterwards I passed my finger through the laceration, broke down the septum, and found the parts above normal.

Examination on the 11th of November showed that an inch from the hymen a ring could be felt admitting the index finger easily. The organs were otherwise normal.

The question now arises, in view of such cases, as to the developmental origin of the vagina, or, to put it as embryologists do, What is the Anlage of the vagina?

The ordinary view is that the vagina is developed from the ducts of Müller, and that the urino-genital sinus takes no part in its formation. The ducts of Müller are at one period of their development double, while the urino-genital sinus is always single. The occasional double hymen at the ordinary hymeneal site is so easily explained by the supposition that we have in this anomaly a persistence of the double ducts of Müller, that it has been unhesitatingly accepted as a proof of the origin of the vagina in its whole extent from these canals.

In a recent communication,[1] I endeavoured to show that the hymen was developed from two bulbs (the Wolffian bulbs) which formed at the lower ends of the Wolffian ducts, and that the epithelial cells from these bulbs proliferated into the Müllerian vagina, rendering it solid, the lumen being formed by the central cells breaking down. I did not discuss then what I now wish to consider, viz., the Anlage of the vagina.

In a sagittal mesial section of a female fœtus of about 12–25 mm. in length, the vagina appears to be formed by the coalesced Müllerian ducts, and to end at the top of the narrow urino-genital sinus in the eminence of Müller. Below this eminence the Wolffian ducts open, and lower down we have the cloaca into which the urino-genital sinus and bowel open.

In a fœtus somewhat further advanced (end of second month) we find a condition established as shown in Keibel's diagram (Fig. 1).

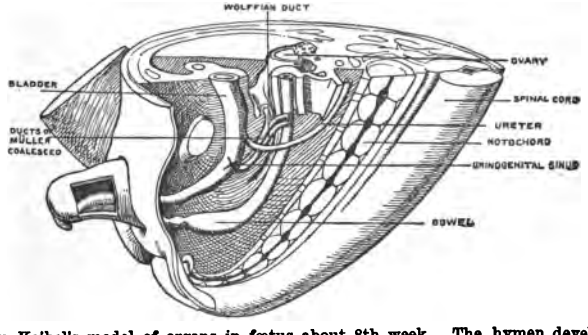


FIG. 1. From Keibel's model of organs in fœtus about 8th week. The hymen develops below the level of the cross (†).

We see here the relatively long urino-genital sinus with the

[1] *Journal of Anatomy and Physiology*, Oct. 1896.

eminence of Müller at its top where the ducts of Müller end. Here the hymen is stated to develop, and as the urino-genital sinus is believed to be represented in the adult solely by the shallow vestibule, it is said to shorten considerably. Certainly in the newly-born infant the hymen is more deeply placed, and the vestibule somewhat pit-like.

If, however, the hymen develops, as I have indicated, by the formation of the Wolffian bulbs, it is evident that the upper part of the urino-genital sinus must enter into the formation of the lower part of the vagina. The occasional double hymen is really a persistence of the Wolffian bulbs, and not the lower ends of the Müllerian ducts, which, so far as our present knowledge goes, seem to end blindly in the eminence of Müller.

What happens, therefore, at or about the third and a half month in the development of the vagina is as follows:—Below the level of the eminence of Müller, and therefore at the top of the urino-genital sinus, the hymen develops by the formation of the Wolffian bulbs. These block the top of the sinus at first, but by their coalescence and central breaking down, aided by the involution from below, the hymeneal opening is established.

The adult vagina, therefore, has its lower third developed from the urino-genital sinus, the upper two-thirds from the ducts of Müller.

There can thus arise three defects in development in the lower part of the vagina, viz.—(1.) We may have a transverse septum at the site of the hymen due to the persistence of tissue between the lower ends of the coalesced Wolffian bulbs and the involution below from the urino-genital sinus (Fig. 2).

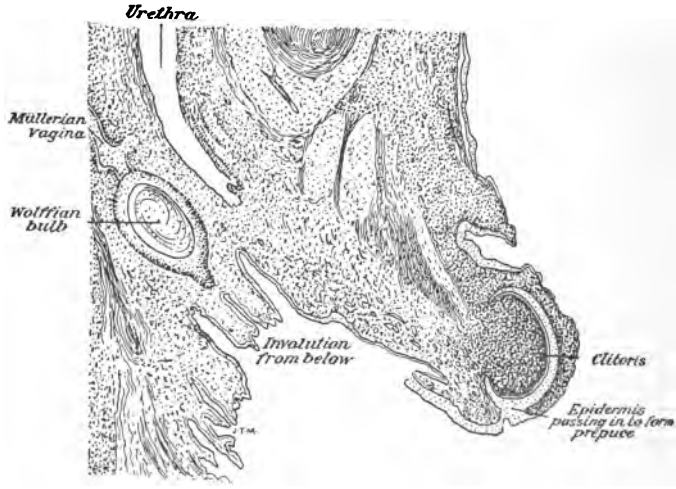


FIG. 2. Section of a 8½ months' female fœtus (♀). The three possible atresia conditions can be seen.

(2.) There may be a transverse septum at the ends of the coalesced ducts of Müller an inch above the hymen. This was the condition in the second case.

(3.) There may be a persistence of the Wolffian bulbs, so that we get a persistent narrow sinus after operation, between the hymen and the Müllerian vagina above. Of this I have seen one case, but have no notes, unfortunately.

In regard to the treatment of such cases, I recommend free incision after the parts have been thoroughly shaved and cleansed. While the blood is escaping, the purified finger can be passed in to ascertain the conditions of the organs, and if the uterus is not involved, the vagina can then be washed out with a mild antiseptic. Should, however, the uterus be dilated, I would avoid this washing out, and merely receive the discharge into antiseptic diapers.

Prof. Simpson said the Society were indebted to Dr Hart for a very valuable and instructive contribution in the paper he had read. He (Prof. Simpson), like many of the other Fellows, had met in practice with cases such as Dr Hart had described, where there was an atresia of the vagina at a point higher up than the level of the hymen, and had set them down as due to defective development. But it was only in looking at Dr Hart's illustrations and hearing his explanation of them that the nature of the imperfection became manifest. The session had been inaugurated by a first-class Presidential Address, and this first communication embodied first-rate original scientific work.

Dr Haultain said that he had met, while operating with Dr Halliday Croom on a case of atresia vaginæ, with a distinct space filled with fluid between the hymen and the true atresia of the vaginæ, the latter of which was at least three-quarters of an inch in thickness. Though at the time unable to account for the peculiar sacculated condition of the atresia, it was now evident, from what Dr Hart had demonstrated, that the space was due to a want of complete fusion in the genital cleft, and also between the Müllerian eminences.

Dr J. W. Ballantyne said that, like Prof. Simpson, he had been much impressed by the value of Dr Hart's demonstration and contribution. He thought it afforded an explanation of the considerable depth of the pouch formed by the vulvar canal in cases of absence of the upper part of the vagina, for he had never been able to understand how pressure alone could so deepen it. Further, his explanation of the transverse septa in the vaginal canal seemed a much more adequate one than the commonly accepted theory of a fœtal or intra-uterine adhesive colpitis gluing together the walls, and so producing a septum.

MEETING II.—DECEMBER 9, 1896.

Prof. A. R. SIMPSON, *Vice-President, in the Chair.*

I. *Dr R. C. Buist*, Dundee, showed specimen of RETROFLEXION OF THE HEAD WITH SPINA BIFIDA ANTERIOR.—The specimen was taken from a still-born female child given me by Dr Mackie Whyte, Dundee, and consists of the cranium and spine, which have been split in the mesial plane, and of the spinal cord, which has been left on the left half. The head was hydrocephalic and markedly retracted on the neck, and the occipital foramen was expanded, and communicated directly with a posterior spina bifida extending down as far as the middle dorsal vertebræ. The supra-occipital bone consists of four separated parts, and the head rocks on the ends of the styloid processes, which articulate with the sides of the posterior spina bifida. There is anterior spina bifida from the third cervical and the first dorsal vertebra, and into this a meningeal sac protrudes. At this point the spinal cord is thinned out in the middle, and the two lateral masses are some distance apart. The brachial plexuses were normal, as were the internal organs and the limbs. The brain, even after two months in 10 per cent. formatin, was diffluent, and could not be preserved.

II. *Prof. Simpson* showed—(*a.*) ANENCEPHALIC FŒTUS whose membranes had been adherent to the dura mater.

(*b.*) SECUNDINES from case of triplets.

(*c.*) OVARIAN FIBROMA removed by laparotomy from a woman 59 years of age. She was a widow, and had had two children, born thirty-five years ago. For two years she had complained of an abdominal swelling and pain, which had gradually increased in severity. Menstruation had ceased eleven years ago. The tumour was freely movable, and the uterus lay behind it, and did not move with it. At the operation the abdominal incision had to be prolonged up beyond the umbilicus before the fibroid could be extracted. Its pedicle was attached to the right broad ligament, the ovary of that side having entirely disappeared in the tumour, which measured 8 in. by 7 in.

(*d.*) A MULTILOCULAR OVARIAN CYST, removed from a multiparous woman, 63 years of age. The patient had first noticed the swelling eleven months previously, and about five months ago it began to grow at an alarming rate. Menstruation had ceased twenty-three years ago. Ovariotomy was performed, a large cystic swelling containing several gallons of chocolate-coloured fluid was removed, and several vascular adhesions to omentum and abdominal wall were ligatured.

(*e.*) A DOUBLE OVARIAN CYST, removed by laparotomy from an unmarried patient, 22 years of age. The abdominal swelling had been noticed for three months. Menstruation was normal. A unilocular cyst of the right ovary was first removed, and then a multilocular growth of the left ovary was similarly treated. The patient made a good recovery.

(*f.*) A PAROVARIAN CYST, removed by laparotomy from an unmarried woman, 22 years of age, who had for a year noticed an abdominal swelling. The right ovary and tube were adherent to the swelling, and were removed with it. Recovery.

III. *Dr Scott M'Gregor* showed—(*a.*) Specimen of TUBAL GESTATION.—Mrs O., æt. 30, operated on by Dr Bell, assisted by Dr Scott M'Gregor, at the Glasgow Hospital for Diseases of Women. Amenorrhœa began ten months ago; seven months later hæmorrhage began, and has persisted up to the present date. A bleeding fibroid was diagnosed, and accordingly she was operated on on November 4, 1896. The tumour had a distinct pedicle, and was thus easily removed. The pedicle was treated extra-peritoneally. On opening the tumour a fœtus was discovered inside. The patient made an uninterrupted recovery.

(*b.*) A specimen of HÆMATOMA OVARII. Patient, aged 50, had been a chronic invalid for the past five years, suffering from metrorrhagia. She was quite anæmic on admission to the hospital. An operation was determined upon. The uterus was about the size of a cocoa-nut, therefore the removal of the ovaries was considered imperative. Dr Bell, with his assistance, removed both ovaries; the one had a distinct hæmatoma ovarii, and just about to burst at one point. The other ovary had a distinct fibroid consistence. The patient made an excellent recovery.

IV. *Dr J. W. Ballantyne* showed photographs of an infant with TRUE CONGENITAL PROLAPSUS UTERI, which had been sent to him by Dr Neugebauer of Warsaw. There was, in addition to the prolapse, a spina bifida (myelo-meningocele) in the lumbar region, an ectropion of the anal mucous membrane, and general hypertrichosis, with special tufts of black hair in the middle line below the spina bifida. Dr Ballantyne had recently seen two cases of this very rare anomaly; of which an account by Dr J. Thomson and himself will shortly appear in the *American Journal of Obstetrics*. In all the three there was the associated spina bifida, and the conclusion was almost forced upon him that the spinal lesion was at any rate one of the causal factors of the prolapse.

V. *Dr Haultain* showed a SOLID OVARIAN TUMOUR, and said he considered it quite an exceptional coincidence that two such tumours should be exhibited at the same meeting of the Society, considering the rarity of this form of neoplasm. The specimen

shown weighed 1¾ lb., and was diagnosed two years before its removal as a subperitoneal fibroid of the uterus, but recently having given rise to extensive peritoneal effusion, its true character became apparent, and removal was undertaken. On removal the ascitic effusion was found to be markedly hæmorrhagic, and it was at the time thought to be indicative of malignancy, but microscopically it proved to be a simple fibroma, in which there was present marked signs of inflammatory change, large areas being infiltrated with leucocytes and serous exudation. In fact, it closely corresponded microscopically to the appearance of a chronic interstitial ovaritis. In the centre of the tumour was a large cavity filled with blood, which showed the characteristics of a degenerative cyst, the walls being uneven and the cavity bridged across by trabeculæ, resembling closely the columnar cavernæ of the cardiac ventricles. In fact, the whole tumour on superficial examination might be at first mistaken for an enlarged and hypertrophied heart. From its close resemblance in structure to chronic interstitial ovaritis, it might be considered probable that a certain proportion of ovarian fibromatæ were nothing more or less than originally chronic interstitial ovaritis, in which hypertrophy of the connective tissue instead of atrophy supervened. Doubtless in this case the inflamed and congested state of the tumour accounted for the associated ascites. The patient, since the removal of the growth six weeks previously, made an uninterrupted recovery, and has shown no signs of a recurrence of the ascites.

VI. *Dr Haig Ferguson* showed—(*a.*) An OVARIAN and a PAROVARIAN TUMOUR from one patient, which he had removed by abdominal section four days previously. The parovarian tumour, which was about the size of a duck's egg, lay deep down in the pouch of Douglas, closely attached to the corresponding ovary, which was adherent to the deepest part of the pouch, and beginning to be cystic. The patient had complained lately of great pain in defæcation. The adhesions were easily separated, and the cyst was removed entire along with the ovary. The other ovary (the left) was a well-marked example of a multilocular cyst. It was interesting to note that the patient's temperature never reached 100° F.

(*b.*) Specimens of the NEW HYGIENIC LINEN UNDERCLOTHING made in Cologne, and recommended by Prof. Pettenkofer. It is meant as a substitute for flannel, and it is claimed that it keeps the body warm and at a more uniform temperature, allowing at the same time a free evaporation from the skin, even in great perspiration, without chilling the surface.

VII. HERNIA INTO THE UMBILICAL CORD.

By R. C. Buist, M.D., C.M., Dundee.

On Aug. 24, 1896, I saw a child which had been born the day before. The child, a full time male, 51 cms. long, was well, and except at the navel, well formed. At the navel the abdominal wall was defective over an almost circular area of 6 cms. diameter, the space being occupied by a nearly hemispherical swelling covered by the expanded membranes of the umbilical cord. The swelling protruded about 2 cms. from the abdominal wall, and in the middle line, a little below the summit, the cord was continued and of ordinary thickness. According to the midwife the cord was rather long. In the membranous covering on the left side and at the lower part were two large vessels with fluid blood. At its junction with the membrane the skin was raised in a small fillet with reddened margin. The membranous covering could not be moved across the contained structures, but along with them could be depressed below the level of the abdominal wall, though this usually occasioned crying. The parts, which had been treated as usual, and were stinking, were dusted with boric acid and bandaged.

The parents would not give consent for operation, and the parts were dressed and steeped in actol solution (1–4000) under a pad of cork covered with gutta-percha. On the second day considerable œdema of the tissues in front of the pubis, including the penis and scrotum, occurred; this gradually subsided and did not seem at any time to interfere with micturition. A line of separation seemed to be forming between the skin and membranes.

The parents having at length made up their minds, the child, seven days old, was put under chloroform. I made an incision all round the swelling, about ½ cm. from the skin margin, and dissected down to the peritoneum, which could not be separated, and was divided all round by a probe-pointed knife. The omentum was adherent at the left margin of the sac, and was ligatured and divided; the descending colon protruded into the opening. The sac wall was then gradually turned back, the umbilical vein ligatured and divided above this, and on the right side the sac was adherent to the surface of the liver, which partly protruded. This adhesion was soft, and was separated by sponging, and the sac wall was completely removed, and then, by a series of deep and superficial silkworm gut sutures, the abdominal wall was closed.

The child was a little chilly and cyanotic after the operation. It was given a drachm of castor oil. A natural-looking motion occurred in a few hours. The child was afterwards quiet, and ejected a good deal of frothy mucus. The evening temperature was 98°·2.

During the night it was quiet; crying a little about 2 A.M. About 4 A.M. it took the breast, but did not suck readily, and vomited afterwards. About 8 A.M. it died unexpectedly, and seems to have had some bilious vomiting at the time.

The same day at examination of the wound, the abdominal wall, omentum, and liver were found united by soft adhesions, and the liver removed. The liver, except in the neighbourhood of the round ligament, is of normal form, and the distribution of the ducts and vessels is also normal. Right lobe, 7×7 cms.; left, 4×6 cms.

At the lower margin there is a projecting mass of liver substance continuous on the under surface with the quadrate lobule, and the gall-bladder is sunk in it on the right side, and on the left the round ligament disappears into the mass, which it traverses at a depth of 1 cm. On the anterior surface the mass is marked by a furrow extending from the tip of the gall-bladder to the round ligament. The part below the furrow is rough, being the part which was adherent to the covering of the cord. The broad ligament is continued down to the point where this attachment begins. The projecting mass measures 6 cms. anteriorly, 8 cms. posteriorly, and has a circumference of 13 cms.

The points of interest in the case seem to be the mode of production of the anomaly, and the treatment. Breus suggests that these cases are of two kinds, one due to persistence of the fœtal condition at the time when the gut is normally in the stalk of the umbilical cord, the other due to arrest of development of the abdominal wall. In this case the marked though localised overgrowth of the quadrate lobe of the liver might be supposed to exercise a restraining influence. This overgrowth occurs in other cases of muscular defect,—*e.g.*, in the diaphragm.

The treatment will naturally depend on the size of the defect in the abdominal wall, and the condition of the hernial content. Expectant treatment, which in rare cases allows the child to live but does not cure the hernia, will be adopted when no other is possible, either because the size of the defect makes it impossible to close the wound, or because the parents refuse operation. When the hernia is on a narrow base and the contents can be pressed into the abdomen, Breus' percutaneous ligature will be available. If the membrane of the cord can be easily detached from the peritoneum, this with its content may be returned unopened and the skin closed over it. Where, as in my case, everything is matted together, the peritoneum must be opened, the viscera returned, and the skin closed as in an ordinary cœliotomy. The operation should be done at the earliest possible moment. Delay impairs the prognosis, and should I have to treat another case, I should be disposed to let the expectant treatment continue where operation has been for a week refused, even though a difficult and dangerous operation for hernia be the ultimate prospect. If performed immediately on birth an anæsthetic may be unnecessary.

The literature of the subject is summarised by—

(1) BREUS—*Samml. klin. Vorträge* (Volkmann), N. F., No. 77, 1893.
(2) LINDFORS—*Centralbl. f. Gynæk.*, 1884, S. 472; 1889, S. 482.
(3) MACDONALD—*Amer. Journ. Obstet.*, 1890.

Dr J. W. Ballantyne said he had had an opportunity within the last few weeks of seeing a case similar to Dr Buist's in the Sick Children's Hospital under the care of Mr Joseph Bell. In it, however, the hernia in the umbilical cord was much larger, and as the infant showed signs of prematurity, and as the cord attached to the sac was already gangrenous, no operative interference was recommended. The infant, a female, died a few days later. It seemed scarcely possible to have hoped to return the enormous mass of viscera in the sac back into the abdomen. In a case of congenital diaphragmatic hernia Dr Ballantyne had noted a malformation of the liver resembling that in Dr Buist's case, and it was an interesting question whether the hepatic malformation was the result, or to some degree the cause of the herniation.

VIII. *Prof. Simpson* communicated the following paper by *Dr Adamson*, Moniaive, entitled NOTES ON A CASE OF TRIPLETS:—

Mrs M'C., æt. 34. *Family history* contains nothing of importance. *Personal History.*—Began to menstruate at 12 or 13; was regular until, at the age of 17, she caught a chill during a period. At that time she was laid up for some weeks, and her legs were very much swollen. For some years afterwards she suffered a good deal from anæmia and amenorrhœa. Menstruation, twenty-eight day type, lasting three days. Has been married for eight years, and her general health has been good. She has had five pregnancies. The first three resulted in healthy children, born at full term,—two girls and a boy. The youngest was born in July 1893. In April 1895 she was delivered of a dead fœtus at about the sixth month. Menstruation recommenced soon afterwards, and went on regularly till last February. At the end of May she came to me and said that for some time she had been feeling weak and easily tired; there had been a pain in her right side, and *only a few days* before coming to me she had discovered a lump in her abdomen on the right side. She had missed her period at the end of March. At the end of April her menses recurred as usual. In the middle of May, and again in the last week of the month, she had a slight bloody discharge, lasting for one day. She was certain that she was *not* pregnant. On examining her abdomen I found what seemed like a six months' pregnant uterus lying well to the right, and raised well up out of the pelvis. There was a distinct bruit. The woman was evidently pregnant, but the size of the uterus did not correspond with the time that an ovum might have been developing, and its position was unusual. I therefore gave the opinion that she was pregnant, had been so for several months, and that there was some unusual condition present. Prof. Simpson kindly saw her, and gave it as his opinion that it was a case where menstruation had continued after an ovum had begun to develop, that she was at least four months gone, and that there was probably an excess of liq. amnii. All went well

until the morning of August 28, when the "waters broke." When I saw her there had been no pains. A very small leg was presenting through an undilated os. In the course of the day I tried twice to stimulate the uterus by giving ergot, and injecting hot boiled water into the uterus through a gum-elastic catheter fixed to the end of a syringe, with little result. At 10 P.M. the first fœtus was born. It was a male, 7½ inches long, shrivelled and brown. Then a bag of membranes formed, and the breech of a larger child presented. Pains were feeble and few, and three hours later it was born. It also was a male, 15 inches long, fairly well nourished. Its heart beat for some minutes, and it gave one or two convulsive movements, but there was no attempt at breathing. Artificial respiration carried on for some time was of no avail. With the liquor amnii and clots following this fœtus a third made its appearance. It was shrivelled and brown, like the first, but larger—9⅞ inches from vertex to heel. The placentæ followed in the course of ten minutes. The mammæ did not give much trouble. She made a good recovery. The secundines show a common placental mass and a common chorion. The living fœtus had lain in a separate amniotic sac attached to the largest portion of the placental mass, which had the umbilical cord attached to the margin. The other two fœtuses had lain in a common amniotic sac, and the atrophied cord of the long macerated fœtus was attached to the membranes at some distance from the placental border.

Dr Simson Fowler said that he had listened with much interest to Dr Adamson's paper, and would like to relate shortly a case of triplets which occurred recently in his practice. A girl, æt. 16 years and two months, was seized at the sixth month with labour pains. She was a dairymaid, and her mistress sent her home in a cart. The first child presented by the breech, and was born ten minutes after my arrival. On puncturing the membranes the funis and hands prolapsed, and the head of the third fœtus pushed the head to the left, and prevented progress of the labour of this second fœtus, which presented in the R.O.P. position. The third head was pushed up and the funis and hands replaced, and the birth of the second child was soon effected. On rupturing the membranes of No. 3, the cord, hands, and feet prolapsed in front of the head, which presented L.O.A. On attempting to replace these a powerful bearing-down effort was made, and the fœtus, with hands and feet in front of head, was born in one pain. Fortunately, although the girl was young, she had a large, roomy pelvis. The three children were boys, about 10 inches in length, fairly well developed. They all three breathed, and died shortly after birth. The first lived four hours, the third lived one hour, and the second lived nearly twenty-four hours. The placenta was large, and easily expressed. The girl made a good recovery, and on his visit on the fourth day he found her helping her mother

with her household work. The father was a lad who had just completed his nineteenth year.

IX. THE CAUSATION OF TWINS, AS ILLUSTRATED BY SOME CLINICAL HISTORIES.

By J. W. Ballantyne, M.D., F.R.C.P.E., F.R.S.E.

This is not a statistical communication; it is simply the record of some interesting histories of families in which twins have occurred and the application of these facts in the illustration of one of the theories of the cause of twin-births. The records have been obtained from patients attending my cliniques at the Western and Cowgate Dispensaries. They were not picked cases, but occurred practically in the order given below.

(1.) Mrs A. has a family of thirteen, including twins, boy and girl; she is herself one of a family of ten. There is no family history of twins on either side.

(2.) Mrs B. is one of a family of ten, including twins, and although only married for a few years she has already three children. No family history of twins on either side.

(3.) Mrs C. is one of a family of nine; she has already (she has not been long married) a family of five, including living twin girls; and her husband is one of a family of fourteen. No family history of twins on either side.

(4.) Mrs D. has a family of thirteen, and is herself one of a family of nine. Her husband's mother had a moderate family, including twins. No other record of twin-bearing was remembered.

(5.) Mrs E., aged 33, has already a family of eight, and is herself one of a family of nine. Her mother's sister had once twins.

(6.) Mrs F., aged 48, has a family of twelve children, viz., girl, girl, girl, twins girl and boy, girl, boy, boy, girl, boy, and two others dead-born, sex unknown. She is herself one of a family of twelve.

(7.) Mrs G., aged 37, has a family of five, but has been suffering from pelvic disease since birth of last child some years back. She is one of a family of thirteen. Her eldest sister has had twins once (two boys, still-born), and is now, at the age of 50, in an asylum. Another sister, aged 30, has also once had twins (boys, still-born). Her husband is also one of a family of thirteen, but she does not know whether there is any record of twins on his side.

(8.) Mrs H., aged 40 years, is one of a family of thirteen, including female twins, of which she herself was one. She has herself had a family of fifteen, including twins (a miscarriage), but it is noteworthy that of the fifteen only three now survive. There is no history of twins on the father's side.

(9.) Mrs I. has a particularly interesting family history. She is one of a family of seventeen children, no twins; and one of

her sisters has had triplets and another twins. She herself has had twenty-two children in eighteen confinements, viz., four times twins and fourteen single births. Her youngest child was born a few months ago, and she is not yet at the climacteric. So extraordinary is this record that it may be given in detail. The first confinement produced a boy, dead born; the second, twin boys at the sixth month, dead born; the third, a boy, dead born; the fourth, a girl, who lived six weeks; the fifth, a boy at the eighth month, who died in ten days from umbilical hæmorrhage; the sixth, a boy and girl, at the sixth month, dead born; the seventh, a boy, dead born; the eighth, a boy, still alive; the ninth, a boy, died in sixteen days from umbilical hæmorrhage; the tenth, a girl, still living, aged ten years; the eleventh, a girl at the full term, died shortly from convulsions; the twelfth, a boy who died at age of one year from wasting; the thirteenth, a boy, who died when six weeks from wasting; the fourteenth, a girl, who died of whooping-cough at eighteen months; the fifteenth, a boy, still living; the sixteenth, twin boys at the sixth month, one of whom survived his birth and that only for twenty-four hours; the seventeenth, twins, a boy and girl, both living, but the girl showing signs of infantile atrophy;[1] and the eighteenth, a boy, who died when six weeks old, cause unknown. The nett result, therefore, of all this child-bearing is now represented by five children, including the most recent twins. It may be added that there were no signs of syphilis.

This last-mentioned history, which is not unlike one reported by J. B. Curgenven[2] in 1869, illustrates very clearly the fact to which I wish specially to draw attention.[3] That is the association of twin-bearing and prolificacy. It ought to be mentioned here that I am not now dealing with the so-called uniovular or monochorionic or homologous twins, for the above principle does not apply to them. In all the cases to which reference has been made there was good evidence to show that the twins were of the binovular or dichorionic kind. The clinical fact may be thus stated more fully.[4] The daughters of a woman who has borne twins are usually highly prolific, and conversely the mothers of twins are usually the daughters of specially prolific women. This fact goes to support the theory of the cause of pluriparity in uniparous animals, including the human subject, which has been recently strongly insisted upon by Dionys Hellin. In his monograph he has shown that the ovaries of the twin-bearer resemble those of

[1] The girl is now dead, and the boy seriously ill. February 1897.

[2] Curgenven, J. B., "Hereditary Twin-bearing Family," *Trans. Obst. Soc. Lond.*, xi. p. 106, 1870.

[3] *Vide* also Valenta's extraordinary record in the *Wien. med. Wchnschr.*, No. 3, 1897.

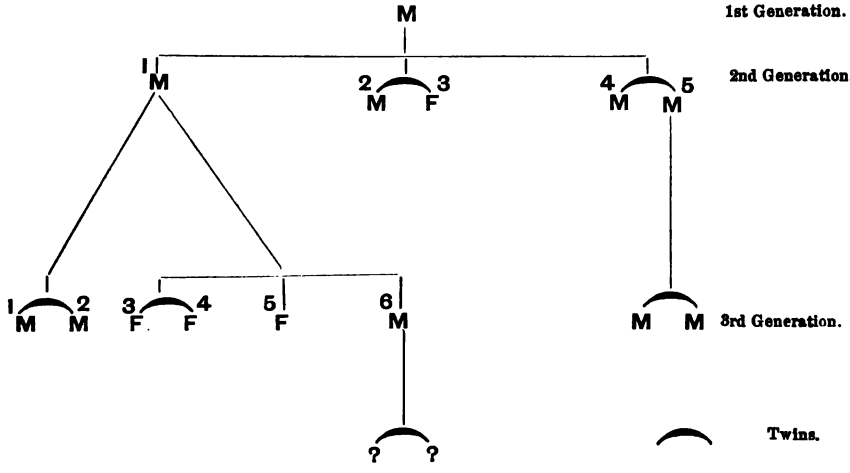
[4] Hellin (D.), *Die Ursache der Multiparität der uniparen Tiere uberhaupt und der Zwillingschwangerschaft beim Menschen insbesondere*, p. 31, Munchen, 1895.

the fœtus in the great number of Graafian follicles which they contain. He thinks that plural pregnancy in a uniparous animal results usually from the simultaneous rupture of several ovisacs, and is of opinion that the simultaneous rupture of several follicles is the consequence of the existence of a relatively or absolutely larger number of ova in the ovary. This dependence of plural pregnancy upon a larger quantity of ova in the ovary explains how it is that the mothers of twins are usually also very prolific. Prolificacy and plural pregnancy, therefore, are merely different forms of one and the same manifestation. Hellin supports his theory by drawings of the ovaries of fœtuses of a pluriparous woman, of a calf, and of a cow that had given birth to twins.

The facts I have stated, so far as clinical evidence is of value, seem to afford support to Hellin's theory, and also corroborate certain statements on the subject made to this Society by Dr Matthews Duncan some years ago.

Dr James Ritchie said that he had submitted to him some years ago a proposal for life assurance by a man, aged 36, who, of a family of thirty-three children born to the same father and mother, was the only single birth in the family. The other thirty-two had been either twins or triplets. At the time of his proposal the prolific parents were still alive, aged respectively 71 and 70; there were still nine of his brothers and sisters in good health. Of the other twenty-three, nearly all had died at or soon after birth.

Dr Keppie Paterson showed the following GENEALOGICAL TABLE tracing the occurrence of twins to the male progenitors. It was seen at Prof. Winckel's Clinic, Munich. In three generations there were nine births, and of these, six were twins. The man had twins both by his first and his second wife. There were few recorded instances of the male influence evidently preponderating in the causation of twins, and of these, not all seemed authentic.



Dr Hugh Jamieson referred to a remarkable case of a woman who had twins twice in succession, and whose next two labours were triplets. One of the triplets died; others alive and healthy.

X. ON SOME PECULIAR RELATIONS OF ABDOMINAL AND PELVIC TUMOURS.

By J. Halliday Croom, M.D.

The object of the present communication is to place on record some cases of abdominal tumours which have had exceptional and peculiar relations. That it is often the unexpected which occurs, is equally true in abdominal surgery as it is in daily life, and perhaps in no department of surgery do unlikely complications occur more frequently than in that to which I now refer.

I have no intention of discussing difficulties and mistakes in diagnosis, both of which are grave and frequent, but rather to refer to a series of cases of ovarian, fibroid, and other tumours which presented peculiar and interesting relations.

Case I.—First of all, with regard to ovarian tumours, the accompanying diagram (Plate II., fig. 1) will sufficiently show a very unusual position and relation of an ovarian cyst. It indicates a distinct dull area above the umbilicus, while between that point and the pubis the resonance is clear and tympanitic. The tumour was fixed, spherical, and cystic, and its nature was a matter of extreme doubt. On opening the abdomen the characteristic blue appearance of an ovarian tumour was at once recognised. It was quite free of adhesions everywhere, except on the anterior surface, where it was attached to the abdominal wall. The pedicle was the longest I have ever seen, measuring 10 inches, and was not in the least twisted, which in itself is a remarkable fact. It is equally remarkable that this tumour should have become attached in the upper abdomen rather than lower down. The history throws some, though little, light on the peculiar features of the case. The patient was a young lady, 25 years of age, sent to me from Ardrossan. Menstruation was perfectly regular; she was in the enjoyment of robust health, and complained of no symptoms whatever except distention of the abdomen and occasional attacks of peritonitic pain. For some months previously she had complained of urinary discomfort, and two months before I saw her, after a long night of dancing, she fainted, and thereafter was laid up with abdominal pain from slight peritonitis. Beyond that there is nothing in the history of the case of any importance.

The usual mechanism of the growth of all ovarian tumours with long pedicles is, that in the first stage the tumour is in the pouch of Douglas, with the tube coursing in front and transversely across the ovary. In this stage the bladder is pressed upon, and dis-

comfort in micturition arises. Afterwards the tumour, as I pointed out in another communication, slips out of the pelvis, accompanied often by a certain amount of shock, and there is along with it often a torsion of the pedicle, usually at the uterine end, and a screw-like action commences, the uterus being left low down below the tumour. This particular case offered obviously an exception to the rule, and the tumour early formed adhesions to the parietal peritoneum, which possibly prevented the rotation of the tumour. As the history showed, the girl did complain of urinary troubles and nothing else, until after a night of prolonged dancing, when she fainted, suffered for some time afterwards from abdominal pain, and it was then the tumour was discovered. I have no doubt whatever that the tumour was freed from the pelvis by the patient's active exercise in dancing, and that on escaping into the abdomen its rapid enlargement was the immediate cause of the pain and peritonitis. As to how it reached its situation so high up in the abdomen, I do not venture to offer an explanation. A history of a tumour like this is, of course, very different from what occurs in intra-ligamentous or sessile tumours, where the uterus is lifted up by the growing tumour, and the neoplasm continues pelvic as well as abdominal during its life-history. I may mention that the operation, as can readily be understood, was simple.

In regard to the length of the pedicle, Sir Spencer Wells (1)[1] records a case where he diagnosed a floating kidney, and later operated for an ovarian cyst on the opposite side, and then discovered the supposed floating kidney was an ovarian tumour with a pedicle over a foot long.

CASE II.—A young woman presented herself at the Hospital with no very definite symptoms, except irregular menstruation and obscure pelvic pain. On examination a tumour about the size of a small cocoa-nut was found occupying the pouch of Douglas, displacing the uterus upwards and forwards. The tumour was very tense, and owing to its disposition with regard to the uterus, it was diagnosed as a sessile ovarian cyst. On opening the abdomen and passing my hand into the pouch of Douglas, the tumour slipped up into the abdomen. It was quite free of any adhesions, and I was able to lift it out entire without securing or ligaturing anything whatever. It proved to be a simple ovarian cyst, and this was corroborated by the absence of the ovary on the right side. On putting my hand into the pelvis afterwards I found no trace of any pedicle, and there was no hæmorrhage whatever. The surface of the tumour was smooth, save at one point, where there was a little roughness. The problem, of course, is to account for the method by which this

[1] The figures within parentheses refer to Bibliography at end of paper.

neoplasm was separated from its attachments and subsequently nourished.

One cannot but think that the only possible explanation is that it had been unconsciously torn during removal; if that were so, no trace of it could be found, and there was no hæmorrhage.

CASE III. presented some remarkable features. The patient, a married woman, was sent to me as suffering from acute peritonitis. After the severity of the inflammation had somewhat subsided, she was found to have a small dull area between the symphysis and the umbilicus, and a cystic tumour, probably with a twisted pedicle, was diagnosed. On opening the abdomen the usual dark appearance of an ovarian tumour, into which blood had been extravasated, was observed. The tumour was adherent to the anterior wall, and, on being separated and removed entire, it was found that the pedicle was not only twisted and very small, but had given way (see Plate I.) close to the neoplasm. Evidently this separation had taken place some time previous to operation, because the pedicle was dry and firm, and there was no indication of hæmorrhage. The pelvic end of the pedicle was not secured, for the very good reason that it could not be found.

CASE IV. I record simply as a curiosity, because I am not at all sure of its nature. The facts are these:—E. M. was sent to the Hospital by Dr Lindsay of Balfron, and the case seemed a simple parovarian tumour, which extended upwards to 1 inch above the umbilicus. After opening the abdomen and exposing and tapping the tumour, which was pale in colour, one slight adhesion to the abdominal wall was secured with catgut, and thereafter the tumour was simply pulled out of the abdomen by Dr Lackie, who was assisting me, there being no further adhesion and no apparent attachment to any pelvic or abdominal organ. The fluid was absolutely clear like water, and the tumour was not ovarian, because the ovaries were intact. What it really was I regret to say I cannot tell, because the preparation was unfortunately destroyed immediately after the operation, through some misunderstanding. Here, again, it is remarkable that a tumour of such size should have maintained an independent existence in the abdominal cavity with only a slight adhesion to the abdominal wall.

I have twice been called upon to operate on tumours occupying the pouch of Douglas, giving rise especially to bladder trouble, and in which, after the lapse of a week or two between the diagnosis and the day of operation, the tumours have completely disappeared, rendering, of course, operative interference unnecessary. As no operation was performed, and fortunately no autopsy necessary, I can only surmise that these tumours were parovarian cysts, whose contents were perfectly harmless, which had ruptured and collapsed.

PLATE I.

Pedicle.

PLATE II.

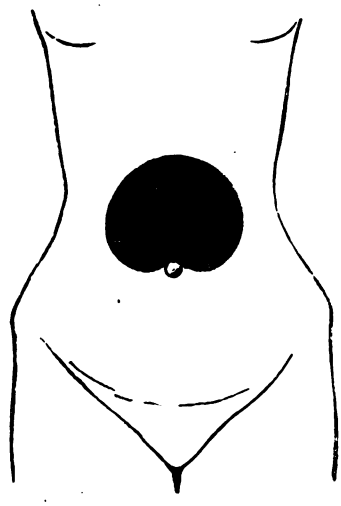


FIG. 1.

FIG. 2

FIG. 3.

I have seen a somewhat similar case of a pear-shaped tumour on the left side of the uterus in a woman aged 35, married, with three children, suffering from constant pain in the side, premenstrual dysmenorrhœa, menorrhagia, and leucorrhœa. From the shape of the swelling, the symptoms it gave rise to, the easy recognition of the ovary, and the apex of the tumour running into the uterus, I regarded it as a dilated Fallopian tube. Between seeing her at the Hospital and her return for operation, a fortnight later, the tumour had entirely disappeared, leaving nothing but a slight fulness in the fornix. As no untoward symptoms resulted from its disappearance, it was either a ruptured hydrosalpinx or a hydrops tubæ profluens.

CASE V.—Another remarkable case of the disappearance of an abdominal tumour is that of Mrs S., who was sent to me by Dr John Moir of St Andrews, in January 1895. She was admitted to my ward, suffering from a large abdominal cystic swelling, situated rather more to the right side than to the left. Her history was that she had complained of pain and swelling in the right side for two years, and during the past five months the tumour had considerably increased, while the pain had become much aggravated. The patient was markedly cachectic in appearance, so much so that, in spite of the undoubtedly cystic character of the tumour, it was believed to be of a malignant nature. Three days after admission, about 8 P.M., she suddenly complained of great exacerbation of pain, so that the administration of morphia was necessary. Thereafter the patient passed and continued to pass all night an enormous quantity of dark-coloured urine, and in the morning it was found that the tumour had entirely disappeared. From that moment the patient's general condition improved, and up to the present date there has been no return of the local symptoms.

One frequently reads of what occurred in this case as being a symptom of hydronephrosis, but, in my opinion, it is seldom met with. What really took place it is difficult to say. Whether, as I think is most likely, an adhesion between the lower end of the dilated kidney and the bladder, with subsequent rupture, had taken place, or a kink in the ureter had become undone, or some obstruction in its lumen removed, I cannot say.

CASE VI.—A still more remarkable case, which must be very exceptional if not unique, and which I have recorded elsewhere (9), may not be without interest in this connexion. It was, in brief, that of a patient who was admitted to Hospital suffering from premenstrual pain, menorrhagia, and sterility. On examination a firm, hard tumour, about the size of a billiard ball (Plate II., figs. 2 and 3), was found lying in the pouch of Douglas. I decided to remove it, and on opening the abdomen and introducing my fingers into the pouch of Douglas, with great ease I lifted up the tumour, which was free of any attachment of any kind. No

ligatures were required, there being nothing to secure, and there was no hæmorrhage. The patient made a good recovery, and subsequently became pregnant. The walls of the tumour on examination were found to be those of the Fallopian tube much thinned, and the contents old blood-clot. It was, therefore, a case of hæmatosalpinx,—whether from an early extra-uterine pregnancy it is impossible to say. I know of no possible explanation of this anomaly.

So far as I can discover, I can find no reference to detached ovarian tumours or cystic tumours without some definite relation to an abdominal or pelvic organ. It is true that Sir James Simpson (2) says he has seen several cases in the dead body, in which tumours were lying free in the abdominal cavity, but he gives no details, and evidently refers to fibroids, as he says that the tumours had no connexion with the uterus.

With regard to some of the tumours I have just referred to, they must be very rare, but the case is somewhat different when we come to speak of fibroids; and they may be in this connexion looked at under three heads:—

1. Fibroids with slight attachments to the uterus.
2. Those actually detached.
3. Those detached from the uterus, but adherent to other structures.

1. With regard to semi-detached fibroids, the following two cases may be of interest, in which the pedicle presented peculiar features, with unexpected results on dealing with it.

The first case I saw with Dr Drysdale of Dunfermline. Its history is long and tedious. Suffice it to say, that the operation was undertaken on account of long and continuous hæmorrhage, and the presence of a tumour in the pouch of Douglas about the size of a large orange. On opening the abdomen and pulling the tumour up to the surface, it was found to be a subperitoneal fibroid, which could be easily dealt with. The pedicle was small and thin, and having passed a needle through it in the usual way, so as to apply a ligature previous to removal, and while gently tightening it, the ligature came away in my hands, while the tumour remained in those of Dr Lackie. Naturally I expected alarming hæmorrhage, but there was very little, only a slight oozing from a small denuded surface on the posterior wall. The peritoneum was drawn together over this surface, and the ovaries then being removed, the operation was speedily completed.

The other similar case occurred in Hospital, and was so exactly similar to the foregoing that I need not repeat the details.

The interest of these cases lies in the peculiar nature of the pedicle, and explains how tumours may become completely detached from the uterus. In most cases of subperitoneal fibroids the pedicle is firm and fibrous, and is continuous with the

tumour on the one hand and the uterus on the other. In these two cases the fibrous tissue was entirely absent, the pedicle consisting of only two layers of peritoneum, and on removal the denuded surface of the uterus was quite smooth.

It can be easily understood that a tumour like this, situate in the pouch of Douglas, would be a considerable time in separating; but, had it been free in the abdominal cavity, one can easily imagine that it would drag on the thin vascular peritoneum, interfering with the blood supply, and ultimately causing separation. Such conditions of pedicle would account for some of the second class of subperitoneal fibroids, viz.,—

2. Those which are found free in the abdominal cavity. Although these are referred to in most text-books, I have had considerable difficulty in finding reference to actual cases. I have not met with any in my own experience. Turner (3) refers to a case in which a calcareous fibroid was found free in the pouch of Douglas, and Depaul (4) found a fibroma entirely free in the same situation without any adhesions whatever.

I have already referred to the post-mortem cases mentioned by Sir James Simpson.

3. As to the third variety, they occur apparently much more frequently; that is to say, cases which have either become spontaneously detached, and formed adhesions with other viscera, or, while still remaining attached to the uterus, have become adherent to other structures. It is one of the characteristics of fibroids that they are, unlike ovarians, quite free, and do not readily form adhesions with surrounding structures. And yet a few well-authenticated cases are recorded in which a pediculated subperitoneal fibroid has severed its connexion with the uterus and formed adhesions with other parts, and thereby derived their nourishment. Thus Homans (5) reports a uterine fibroid, which had been completely separated from the uterus, and had caused death by intestinal obstruction, it having formed adhesions with the intestines, and was nourished apparently from the omentum. The tumour weighed $2\frac{1}{2}$ lbs., and on this one case Homans insists strongly on the removal of all subperitoneal fibroids to prevent a similar accident, which, considering the frequency of pediculated subperitoneal fibroids, and the rarity of intestinal obstruction from this cause, seems a somewhat unnecessary radical operation. Huguier (6) and Nélaton (7) each record cases in which subperitoneal fibroids have become independent of the uterus, and attached themselves to some part of the pelvic circumference. Sir James Paget (8), however, points out that fibroid tumours found in the pelvis, unattached to the uterus, sometimes are not the result of separation of the pedicle and adhesions to neighbouring parts, but are really primarily tumours of the muscular tissue of the round ligaments, or utero-vesical or utero-sacral folds.

I have not myself met with any detached uterine fibroid tumour

which had formed connexions with surrounding structures, but I have met with one which, attached to the fundus anteriorly by a long pedicle, had prolapsed into the pouch of Douglas, and there formed extensive adhesions to the rectum. It was removed with considerable difficulty, and its removal resulted in a cure of long-standing dysmenorrhœa.

Although it scarcely falls within the scope of this paper, it seems a suitable opportunity to refer to an exceptional relation of the liver and kidney respectively. As both of these cases have already been recorded elsewhere, I merely make a general reference to them now. The first was a case sent to me from Broughty Ferry, where I found a large tumour occupying the whole abdomen, and which I could feel, per vaginam, projecting into the pouch of Douglas. It proved to be a large sarcoma of the liver. The other case was one in which a patient, a multipara, suffered from extreme pelvic and lumbar pain, and on examination I found a mass high up in the pouch of Douglas, and which I conceived to be pelvic, probably ovarian, tumour. However, on opening the abdomen it was found to be the lower end of a floating kidney.

I have ventured to record these cases simply because such anomalies can, I believe with advantage, be reported for the benefit of future operators. It always seems to me that the records of mistakes and disappointed anticipations are equally, if not more, useful than the records of endless series of successful diagnoses and treatment.

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Prof. Simpson said the Society would endorse the opinion expressed by Dr Croom in his closing sentences, that the record of such rare cases of difficulty in diagnosis was as important as the record of more easily recognisable conditions. The communication was both interesting and valuable, and presented various subjects for consideration. With regard to the loose fibroids, he (Prof. Simpson) had had under observation for some time a patient with a roving tumour which he could not doubt was a detached uterine fibroid. The mobile body, as felt through the abdominal walls, had the size of a goose egg, and had the firm consistence of a

fibroid, and could be pushed about in every direction. The presence of some fibroids in the uterus confirmed the idea that a subperitoneal tumour had become pediculated, and finally detached. The ovarian fibroma which he (Prof. Simpson) had shown that night had a pedicle so small and so slightly vascular that it was easy to suppose that in some accident it might have been torn through without any dangerous loss of blood.

Dr Scott M'Gregor said that while attending Prof. Olshausen's clinique he witnessed a very large solid tumour removed. We were very much struck by the pedicle; it was so attenuated that it seemed as if the tumour was attached by a piece of twine. This was ligatured, and the operation was thereupon completed. No hæmorrhage occurred.

Dr Haultain said that having assisted Dr Croom with some of the cases described, he thought he might be permitted to corroborate the statement of these. He had a lively recollection of the liver, which could be felt through the posterior fornix. With regard to the small mass found free in the peritoneal cavity, which Dr Croom had aptly described as a billiard ball, he had carefully examined it and limiting membrane microscopically; he could not, however, positively assert that it contained muscular fibres, and therefore could not actually be considered attenuated Fallopian tube. It seemed to him more probable that it was a tubal mole, which had been expelled through the abdominal ostium of the tube. He had not, however, examined the contained clot for chorionic villi or decidual cells. These cases of fibromyomata, which, though pelvic, were attached to the uterus merely by an attenuated peritoneal stalk, were, he thought, due to the contraction of the uterus forcing the fibroid nodule from its wall; in these cases the nodules probably originated in the external layers of the uterine wall—were not covered by a thick muscular capsule, and on extrusion were merely attached to the uterus by its peritoneal investment, which could easily be torn through. On the other hand, the majority of large subserous fibromata were surrounded by a thick muscular layer derived from the uterus, which formed the capsule through which they derived their nourishment. In these cases the stalk of the tumour was muscular, and the attachments were extensive. He thanked Dr Croom for his description of such an interesting series of abdominal curiosities.

XI. ON DEFLECTION AND ROTATION OF THE PREGNANT AND PUERPERAL UTERUS.

By R. Milne Murray, M.B., F.R.C.P. Ed., Assistant Physician, Royal Maternity and Simpson Memorial Hospital, Edinburgh.

'It is a well-known fact that the uterus, growing under the influence of pregnancy, tends to incline more frequently to the right than to the left side of the body.

In one group of a hundred cases Pajot and Dubois found that the uterus lay to the right in eighty; in another group of eighty cases the uterus was found to the right in 85 per cent.; in the remaining 15 per cent. it lay either in the middle or to the left. The same tendency to incline to the right more than to the left seems to persist after labour until, at last, the uterus disappears below the plane of the brim. Thus, in thirty recent cases observed in private and hospital practice, I found that in twenty-two of them the uterus lay distinctly to the right side of the mesial line during the first five days of the puerperium. This proportion amounts to 73 per cent.

It would thus seem that in from 70 to 80 per cent. of all cases the uterus inclines to the right side, in about 20 to 30 per cent. it inclines to the left, or lies more or less mesially.

A considerable number of explanations have been suggested of this preponderance of right deviation, but, as Barnes remarks, "none appears conclusive." Levret thought that the inclination was determined by the insertion of the placenta in one or other side of the uterus, but Tarnier states that the uterus is sometimes inclined to the right when the placenta is attached to the left side of the uterine cavity. Desormeaux thought that the deviation was produced at the beginning of pregnancy by the pressure of the rectum on the left side of the promontory, pressing the growing uterus to the right, but Dubois points out that this influence of the rectum in pressing the uterus to the right side was probably compensated by the cæcum on the left, with which it would soon come into contact.

It may be noted that the influence of the rectum as a cause of the deviation seems to receive the countenance of Playfair as being, of all the causes suggested, the one most likely in operation. Were this explanation more plausible than it really is, it seems to me to entirely break down when we come to consider the 20 per cent. of cases in which the uterus is inclined to the left. If the rectum is to be regarded as the cause in the one set of cases, it would require to be shifted over to the right side in order to account for the others!

It seems to me that any explanation which attributes the deviation to the influence of a structure such as the rectum, which occupies a fixed position in relation to the uterus, must be unsatisfactory, in so far as it takes no account of those cases in which the inclination is to the left side.

Another view which falls under this line of criticism is one which I have heard advanced, in which the influence of the liver is credited with the deviation. This view assumes that the presence of the liver on the right side prevents the displacement of the intestines to that side. They are thus crowded to the left, and the uterus naturally inclines to the right. But here again, if this is so, why should—the liver always being to the right—20 per cent. of the cases lie to the left?

Madame Boivin attributed the right lateral obliquity to a difference in the length and thickness of the two round ligaments. The right round ligament, according to her, was shorter and more muscular than the left, and consequently pulled the uterus in that direction. Had this been supported by anatomical evidence it would have been a more or less satisfactory explanation, because it would have been easy to suppose that in a certain percentage of cases the left round ligament took the characters more usually found in the right. Unfortunately for this view, Pajot and Rambaud found no evidence of any such difference in the length of the two ligaments, as had been supposed to exist by Madame Boivin.

We may, I think, safely conclude that none of the explanations advanced of this deviation of the uterus is satisfactory. But it has been taught that the growth of the pregnant uterus is accompanied by another movement which is not less characteristic and constant. According to this view, which is supported by many authorities, the uterus undergoes a rotation of more or less degree about its vertical axis, so that one border comes forward and the other recedes. It has, further, generally been believed that in all cases where the uterus inclines to the right side of the body the rotation is such that the left ovary advances, and conversely, that in left-sided inclination the right advances. This statement, so far as I can ascertain, was first made by Velpeau, but it has been confirmed by many observers since. In the Transactions of this Society, 1892-93, the subject of uterus rotation during pregnancy was discussed in an exhaustive paper by Dr Haig Ferguson.[1] Dr Ferguson was led to study the subject by his observing the development of shock during the compression of the uterus post-partum.

This shock he attributed to the accidental compression of the ovary—the ovary having been brought under the grasp of the hand by rotation of the uterus. This paper of Ferguson's was followed by one by J. C. Webster, in which he stated views diametrically opposed to those of Ferguson. Webster not only combated the explanation of the phenomena advanced by Ferguson, but practically went the length of saying that there was no occasion for any explanation at all, as the phenomena explained did not exist. It would not be easy to reconcile such positions; and it would be safer to assume that someone was wrong. I am bound to say that I arose from the perusal of Webster's paper a sadder (I shall not flatter myself by saying a wiser) man. Regarding clinical methods of observation in this instance as misleading or futile, and arguing mainly from the certitude of frozen sectional ones, he had apparently, and with no uncertain aim, laid another time-honoured obstetric ghost—that of the rotation of the pregnant

[1] *Trans. Edin. Obst. Soc.*, vol. xviii.

uterus. Those of us who had long associated with this venerable myth could scarcely be expected to turn our backs upon it without a pang of regret. To those of us who were teachers of obstetrics its loss was specially affecting. Rotation of the uterus was a pleasant thing to talk about over the lecture-table. Not itself, so far as one could see, of any profound practical importance, we could all the more easily discuss it in a pleasant and entertaining way, without any grave sense of responsibility. A few neat diagrams were at hand to illustrate it, and its production and relations could be further elucidated by a few simple, but convincing, sketches on the blackboard.

Was it to be wondered at that we were parting, with a sigh? At the time, indeed, I was fain to count it as one more of the many relics of the exuberant palæozoic period of theory and practice in obstetrics and gynecology, which had been swept away by the stress of what I may call the "Great Ice Age," which has held the field of these departments for near a quarter of a century. This, too, like many another cherished tenet, had apparently perished in the chill grasp of the frozen section!

Nevertheless, on recovering from the first shock of the destructive criticism of Dr Webster's paper, one could not help wondering whether, in the light of one's own experience and the widely accepted opinions of others, his methods of observation were really so infallible as to be absolutely conclusive. Was it certain that no rotation existed at all?—even if the degree supposed by Ferguson and others did not always exist. An observation which I was able to make myself some time before recurred to me, and did much to cheer me under the depressing negativity of Dr Webster's conclusions. Some years ago Dr Croom performed a Porro operation on a dwarf with a deformed pelvis, at which operation I assisted. I remember very well that after the abdomen was opened, and the lips of the incision separated, Dr Croom drew the attention of those present to the fact that the left ovary was lying under my fingers, which were holding the wound open on the left side. The right ovary was never seen until the uterus was removed from the cavity. And I then vividly called to mind the importance of the time-honoured instruction to the principal assistant at a Cæsarean operation, to bring the uterus to the middle line, and de-rotate it, in order that the incision be made in the mesial plane of the uterus. Had this incision been made under the line of the abdominal wound it would have come near the lateral vessels in the left side of the uterus. If a "living dog is better than a dead lion," how much better is a living woman than a frozen section! This certainly was an instance of a rotation with which one had been familiar.

I am not quite clear how the rotation was ascertained by many of the observers, but some of them have determined it by palpation of the ovary, which they could feel as an ovoid tender mass on one

or other side of the uterus. Among those who have observed this are Tarnier, Budin, Chaignot, and Ferguson. Webster, on the other hand, does not think it often possible to make out the ovaries by palpation against the soft walls of the uterus, and compliments those who think they can on their extraordinary powers of touch! Nevertheless, these observers are not likely to be so mistaken as he would make out; and in the case to which I have referred, and I daresay in many others, we have had the advantage of visual observation, at which he can scarcely cavil.

But there is another consideration which must not be left out of account. No one who sits round this table will venture to deny that the uterus is an extraordinary organ, when he thinks of what it does and what it endures. But it would be even a more extraordinary organ than any of us are prepared to admit if it did expand during the progress of pregnancy without rotating to some degree in the course of its growth. I am the last to unduly exalt *à priori* reasoning, but there are instances in which it cannot be ignored. If the uterus expands absolutely symmetrically, it is the only hollow viscus in the world which does—the bladder, the stomach, the intestines, the heart, all rotate during distension, and de-rotate when relaxed, and I think we may safely assume that the uterus will do likewise. I shall hope to show presently that the rotation of the uterus round its vertical axis is to some degree a physical necessity of its growth during pregnancy, but, in order to bring my views of the relation of this rotation to the admitted lateral deviation during pregnancy into line, I may state now that I regard the lateral deviation as a direct result of the rotation. I hope to show that the distortion of the mass of the early pregnant uterus, which is the immediate result of the rotation, results in throwing the uterus to one or other side of the mesial plane of the body, and so determining the deflection to the right or to the left. If this is true, it must follow that rotation to the right must mean deviation to the right, and rotation to the left will mean deviation to the left. Accordingly, the relations of these two conditions, observed first by Velpeau, will, on this assumption, be one of cause and effect.

It is obviously to the construction of the muscular wall of the uterus that we must look for the explanation of this tendency to rotation. The fibres of this wall, as has been demonstrated by Helié, are arranged in three layers. The outer or superficial layer is largely longitudinal (Fig. 1, after Helié). Some run down the anterior and posterior aspects of the uterus; others run outward to the ovarian ligaments, Fallopian tubes, and round ligaments. The general arrangement may be regarded as rectangular. The innermost layer is mainly circular (Fig. 2, after Helié) in arrangement, forming circular sphincter-like rings round the orifices of the cavity—the os internum and the Fallopian tubes. The general arrangement may so far be regarded as symmetrical.

This statement is subject to modification, because an examination of some of Helié's drawings of this coat shows considerable asymmetry of arrangement.

FIG. 1.

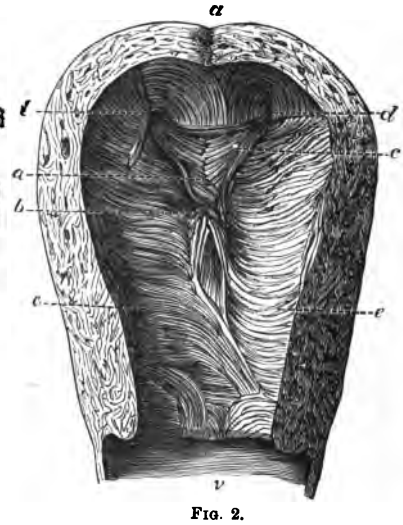


FIG. 2.

Between these two layers we have the middle layer (Fig. 3, after Helié). The characteristics of this coat are,—First, its considerable thickness; and, second, the great intricacy of its arrangement. Its fibres lace and interlace in a very complex way. Some are transverse, some almost longitudinal, and others, the most numerous, are inclined at all degrees between these. Some, beginning near the cervix, can be traced upwards in a sort of spiral towards the fundus and outer angles of the uterus. A glance at any of Helié's or Luschka's figures will show the extreme complexity of their arrangement.

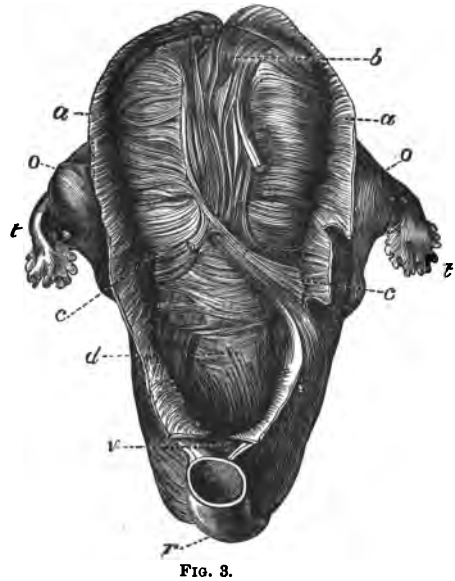


FIG. 3.

Turning now to consider the mode of expansion of the uterine walls, under any condition in which the smallest increase of internal pressure plays a part,

we can readily see that the arrangement of the fibres in these three layers must play a very important part in determining it.

So far as the internal strain is taken up by longitudinal, transverse, or symmetrically oblique fibres, the viscus will expand without any appreciable alteration of the contour or development of distortion. Such a viscus might be assumed to expand with much the same changes in outline as an indiarubber or elastic balloon, whose walls are homogeneous. But when we consider the relations of the middle coat, the conditions are very different. The distribution of strain in such a coat as this must be a highly complex matter, the intricacies of which would baffle analysis. On two points we may be fairly clear:

1. That it is inconceivable that the fibres are so symmetrically arranged that the strain will be symmetrically distributed. In other words, can we imagine that the two halves of the viscus, separated by a vertical mesial plane, can have the fibres of the mesometrium so adjusted, in spite of their complex arrangement, that the resistance of each to internal pressure is identical in amount and distribution?

2. The second point follows from the first. Unless we assume that this symmetrical distribution of strain is possible, it must follow that as increase of internal pressure arises it will produce an alteration of contour and a change in the distribution of the mass of the organ about a vertical axis. In the former case we shall have a certain amount of distortion produced; in the latter, a certain amount of rotation.

Now, though it is practically impossible to analyse the influence of the various groups of fibres in any particular case, it is easy to see in general terms the arrangement of fibres which will tend to a distortion of the organ and that which will tend to rotation.

1. Suppose, for example, we take a group of fibres, whose general arrangement is sensibly transverse. Let us assume that this group is arranged in a fan-shaped manner (Fig. 4). Many such groups can be seen in one of Helié's drawings. The influence of this group at the region *a* will be much more powerful in preventing expansion than at the region *b*, where the fibres are spread out; and, assuming that expansion occurs, it will result in a tendency to distortion in the organ at *b*.

2. Such a tendency to distortion might, however, conceivably be met by the influence of a similar bundle arranged in an opposite fashion, *i.e.*, with the spread of the fan at *a* and the apex at *b*, so that expansion might take place without distortion. This may be rather large an assumption, but it may be admitted in the meantime.

3. But now let us suppose that the point *a* in the first diagram

is shifted more towards the cervix, and the region *b* shifted towards the fundus (Fig. 5), the influence of the band in the behaviour of

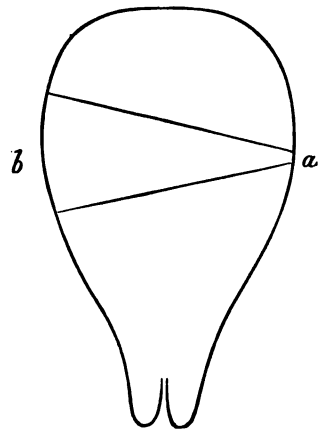


FIG. 4.

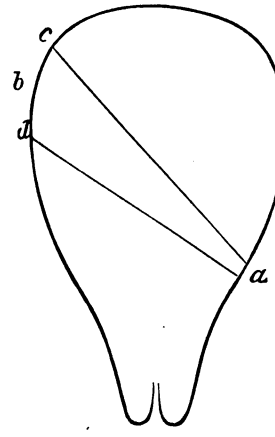


FIG. 5.

the wall, though more complex, is still easily intelligible. We can see that while the region *b* will, as a whole, tend to move away from the point *a*, it will do so to a different extent at its two limits *c* and *d*. For the fibres at *d*, being inserted more obliquely into the mass of the wall, will have less restraining influence than those at *c*, which are acting at more nearly a right angle, and so at greater disadvantage. Hence the point *d* will move to a greater extent than *c*. But *d* being a point in the curved wall of the uterus, its movement will be limited by that surface; and we have here the primary elements of a rotation round a vertical axis (Fig. 6).

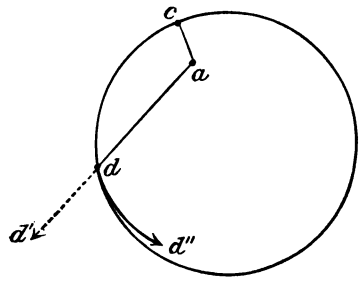


FIG. 6.—Diagram to illustrate movement of the point *d* in relation to *a*. The points *a*, *c*, and *d* are viewed from above. If *d* were free to move outside the uterine wall, it would tend to do so in the direction *d'*; but as it is confined to the curve of the wall, it must move in the direction *d''*.

The arrangement of a very considerable portion of the middle layer of the uterus must, from the shape of the organ, correspond with this theoretical assumption. Bundles of fibres condensed at the lower end of the organ will expand towards the fundus; and unless we imagine the arrangement to be identical on either side, the behaviour of the whole viscus must follow the conditions determining the movements of the parts *c* and *d*. For such a symmetrical arrangement there is no anatomical basis, and it may be said to be physically inconceivable.

Admitting the rotation, we have available an easy explanation of the tendency to deflection or deviation from the middle line

which is so universal. For with rotation about the vertical axis there must result a redistribution of the mass of the viscus round that axis. In the unrestrained condition in which the uterus lies in the pelvis, this will result in a displacement to one or other side, depending upon the direction of the rotation. Thus, when the uterus rotates so as to bring the left side forwards and towards the middle, the uterus will incline towards the right, and when the rotation is in the opposite direction the inclination will be to the left.

Such an explanation not only meets the fact pointed out by Velpeau, that this relation between rotation and deflection always occurs, but it also offers an easy explanation as to why certain uteri incline to the right, and others, though a minority, to the left. It is only necessary to suppose that the direction of the spiral is different in the two cases. In the majority of uteri it is inclined so that the uterus turns to the right, in the minority to the left. We may, I think, thus conclude that the influences determining rotation and deviation are essentially internal and not external.

My attention was specially directed to the subject about two years ago by some observations which were forced on me by what was, in my experience, a unique series of cases. During 1894 I attended nine cases of labour in which the vertex presented O.D.P. The curious thing was that eight of these were in unbroken succession, one normal case intervening between the eighth and ninth. With one exception all were primiparæ. In all, forceps were used. In four of these rotation occurred before the application of forceps, in two it occurred after application, and in three the occiput was delivered persistent. The first case was that of a highly nervous primipara whose powers were vigorous enough, but who was terribly restless during the early part of labour. Rotation began satisfactorily, and after the occiput had come round to O.D.A. I delivered with forceps. The uterus showed some signs of relaxing after the birth of the placenta, though there was no hæmorrhage, and I left the binder off. I remained in the house about an hour and a half, and before leaving examined the uterus, when I noted that it was well contracted and quite responsive, and lying well over to the left iliac fossa. I told the nurse to apply the binder lightly. For the next four days the uterus still lay to the left side, but less distinctly so each day. On the fifth it was still well above the pubis, but now mesial. On the following morning I happened to call earlier than usual and found the patient newly awake, having had a restless night, for some reason. On examining the abdomen I found the uterus far up in that region, pushed completely over to the left side, evidently by the distended bladder. When the bladder was emptied, the uterus became mesial and sank to its normal place. This case interested me in the question of uterine devia-

tion, and, as I have stated, I had special opportunities of observing its behaviour in occipito-posteriors, for the next seven cases I had were all of this order.

The interesting point is this, that in every one of these the uterus lay, after labour, to the left side. This deviation was observed over and over again in the early days of the puerperium, both with the bladder full and with it empty. A full bladder always increased the deflection, and even in the latter days of the puerperium, when the uterus tended to become mesial, the left inclination was re-established by a full bladder. After eight successive cases of occipito-posterior I had a normal one, and in her the post-partum uterus lay to the right. My next was an occipito-posterior, in which left deviation again occurred. Since then I have in private and hospital practice noted other fifteen cases of occipito-posterior, making twenty-six cases in all. All these I have examined during labour, so as to assure myself of the actual position. In all but two of these, left deviation of the uterus was absolutely demonstrable. In eighteen the deflection was quite evident in any condition of the bladder; in four, the uterus lay mesially with the bladder empty and to the left when full. In two cases the uterus seemed to be mesial, and did not show any lateral deviation at all. One of these, a private case, was very fat, and it was difficult to make out the uterine outline at all. The other, a Maternity case, confined during September, had a difficult forceps labour and developed cellulitis on the second day. This possibly fixed the uterus. During the periods in which I have had charge of the Maternity Hospital, in 1895-96, I have over and over again demonstrated to students this relation between uterine deviation and occipito-posterior positions—a relation which I have come to regard as normal.

I think one may take it for granted that, when out of twenty-six cases of occipito-posterior position, eighteen show definite left-sided deviation after labour, there must be some well-defined causal association. Such uniformity of relation is more than can be accounted for by mere coincidence. An association of left-sided deviation with occipito-posteriors has been indicated by Schroeder and Stratz, who gave it as their opinion that the side of the uterus which corresponds to the child's back rotates forward, and, presumably, will deviate accordingly. They would seem to imply that the position of the child was the cause of the deviation. But the grounds on which they do so do not seem quite clear.

Chaignot, on the other hand, found that in thirty cases twenty-one were O.L.A. with right rotation, and three were O.D.P. with right rotation, while two only were O.D.P. with left rotation, *i.e.*, only half his posterior cases rotated left. Ferguson gives it as his opinion that posterior cases do not rotate more frequently to the left than to the right, but does not state the grounds on which he comes to this conclusion.

From what I have said previously, it will be seen that my direct observations point only to the relation between posterior positions of the occiput and deviation of the uterus from the mesial line, and in these cases there seems no ground for doubting, if my observations are correct, that there is a close relation between them. I made no clinical investigation as to the presence or amount of the rotation. It is certainly an interesting fact that there is a fairly close numerical coincidence between the proportion of cases of occipito-posterior position and cases of left lateral deviation—each of these may be put down as representing from 20 to 30 per cent. A numerical value of this sort, derived from observations made quite independently of each other, seems to be of considerable importance.

On the causal relation of these two phenomena—of posterior position and left lateral deviation—I do not at present propose to enter. That such a relation exists goes without saying, but as to whether the position causes the deviation, or the deviation the position, I confess my mind is by no means clear. I am content at present to state the facts, reserving their co-ordination for further discussion and observation.

I may, in conclusion, be permitted to briefly summarise the points to which I would direct attention:—

1. Deviation of the post-partum uterus from the mesial plane is the rule.
2. This deviation is most frequently to the right side of the body.
3. Rotation of the uterus in a vertical axis during growth seems a physical necessity of its structure.
4. This rotation may offer a mechanical explanation of deviation.
5. In the occipito-posterior cases observed, the deviation was almost always to the left.
6. There is an approximate numerical coincidence between the proportion of cases of occipito-posterior and left lateral deviation.

Prof. Simpson said that he had listened with great interest to Dr Milne Murray's lucid exposition of his ideas as to the cause of uterine deviation during gestation, but would like to observe that it was important to keep in view that the unimpregnated uterus presented the same features of deflection and rotation as is seen in the gravid organ. When we had the opportunity of examining a pelvis free from inflammatory or neoplastic changes we usually found the uterus lying towards the right side, and with the anterior surface turned slightly to the same side—as it is represented, indeed, in Schultze's wall-plate, the left border looking somewhat anteriorly. In rarer cases it is deflected and rotated towards the left

side. The observation that Dr Murray had made as to the coincidence of right occipito-posterior positions with left deviations was of great importance, and was well worthy of further study.

Dr Berry Hart said that Dr Milne Murray's paper was an interesting contribution to a difficult subject. The view Dr Murray advanced was an exceedingly hypothetical one, and demanded muscular tension in the uterine wall apart from the action of ordinary uterine contraction. The uterus, however, at full time, indeed, prior to labour was a slackly filled sac, and the intra-abdominal pressure moulded the thin wall like a wet towel on the contents, and practically took a mould of them. If plaster were poured into the full-time pregnant uterus, after the fœtus and liquor amnii removed from a frozen section, one got a cast of the fœtal outline, and not a mere ovoid. He thought Dr Murray would find his task more difficult than he imagined.

Dr J. W. Ballantyne said that his experience of the position of the uterus in fœtuses and new-born infants derived from frozen sections was that the body of the organ was central, and showed no rotation. Of course, at that time of life the uterine body was a very small structure, and might readily be temporarily pushed one way or another; still the result of his investigations was as stated.

Dr Haig Ferguson said he had listened with the greatest interest and pleasure to Dr Milne Murray's able paper. It was well to bear in mind that the uterus is originally a double organ, and that the two halves, as Auvard has stated, do not usually develop equally. The right side seemed, as a rule, to be the more strongly developed. The most strongly developed side tends to be pulled back towards the spinal column, and the less developed side consequently moved forwards, thus causing rotation of the uterus on its own axis. With regard to the tension of the muscular fibres in the uterine wall, it has also to be remembered what he (Dr Ferguson) had already noticed in his paper on Uterine Rotation, to which Dr Murray had referred,—viz., that there is first a *passive* tension on the uterine wall in pregnancy, the result of the growth of the ovum and the intra-abdominal pressure; and, secondly, that, as the result of the intermittent uterine contractions occurring during pregnancy, there was *active* muscular contracture as well going on at intervals during the whole of pregnancy. Dr Ferguson had not found such a constant relationship between occipito-posterior cases and left rotation and deviation of the uterus as Dr Milne Murray had, and he was greatly interested in this important observation.

MEETING III.—JANUARY 13, 1897.

Prof. A. R. SIMPSON, *Vice-President, in the Chair.*

I. *Dr J. A. C. Kynoch*, Dundee, showed specimen of TUMOUR OF RIGHT KIDNEY removed from a female infant sixteen months old by laparo-nephrectomy. The operation was successful, and the child so far (six weeks after operation) was well. The tumour was the size of a closed fist, and its presence had only been recognised on examination of the patient.

II. *Prof. Simpson* showed—(*a.*) An ANENCEPHALIC FŒTUS AND SPINA BIFIDA; (*b.*) FŒTAL ASCITES; and (*c.*) a COLLOID TUMOUR OF OVARY.

III. *Dr Keppie Paterson* showed a GENEALOGY, tracing the occurrence of twins to the male progenitors.

IV. *Dr R. C. Buist*, Dundee, read a note of a case of HÆMORRHAGE FROM RUPTURE THROUGH A MUCOUS CYST AT THE OS UTERI (in a case of complete senile prolapse).—Mrs D., 81, had one child, shortly after which her husband died. For many years she had suffered from complete prolapse of the uterus, for which she formerly used Zwanke's pessaries, but as they always broke, she has of late years left it to itself. She is and has always been an extremely healthy woman, and at present looks much younger than her age. Since the climacteric she has had no genital bleeding whatever until the morning of 5th November 1896, when during the night she was seized with severe bleeding. After some time this got less, but did not entirely stop, and it recurred sharply every time she attempted to get up. In the morning, when I saw her, there had been, to judge from the cloths, considerable bleeding, but not enough to affect the pulse seriously. On examination, I found complete prolapse of the uterus, and close to the os at the left side was an irregular protuberance about 1 cm. high, from which blood was oozing at the inner side of the base. The mass looked exactly like an external hæmorrhoid, except that its covering was rather more white and smooth. On my grasping the base with pressure forceps it proved so friable that the mass came away, leaving a small surface, from which blood oozed freely. A couple of silkworm gut sutures served to control the bleeding, which did not afterwards return. The stitches were removed at the end of a week, and the patient is now quite well, her prolapse being kept in place by a Barnes' pessary. The patient stated that two weeks previously she had been nursing a relative, and had some lifting, which she thought made her prolapse worse, but she does not seem to have noticed the small tumour. There was a little pus among the blood which issued when the tumour was squeezed in removal. The tumour was preserved in 4 per cent.

formalin solution, and shows very well the resemblance to a pile, though it is less livid than it was. On section it shows several small mucous cysts towards the surface. The central part of the mass is occupied by two large spaces with a septum between them, and one of these spaces is stained by blood; these large spaces extend to the base of the tumour. Microscopical examination shows that the two large spaces as well as the smaller cysts are lined with columnar epithelium, that the bloodvessels are full of blood, and that hæmorrhage has taken place into the substance of the tissue here and there, and also into the mucous follicles, in some of which blood and mucus can be seen side by side. In one of the two large spaces traces of blood are still present at parts of the boundary, showing that, like some of the smaller spaces, it was occupied by blood. The process has thus apparently not been, as I at first thought, dilatation of a vein and rupture of the resulting sinus, but passive congestion of the parts, due to the prolapse producing rupture of an adjacent vessel into the mucous cyst, and, secondarily, rupture of the cyst, and the free hæmorrhage which ensued.

Prof. Simpson thanked Dr Buist for his note of this case. It had sometimes occurred to him also to find hæmorrhages in women advanced in life who averred that they were menstruating, but who on examination were found to be the subjects of cervical mucous polypi. The pedicle was sometimes very vascular, and bled freely on division, so that he could well understand how Dr Buist had found it necessary to use sutures for its arrest.

V. RETENTION OF MENSTRUAL FLUID IN ONE HALF OF A DOUBLE UTERUS.

By J. Lamond Lackie, M.D., F.R.C.P.E.

Hæmatometra in a single uterus from either congenital or acquired obstruction of the cervical canal or of the lower generative tract is by no means uncommon, and the literature on the subject is abundant.

Retention of menstrual fluid in one half of a double uterus is a much rarer condition, and I, therefore, venture to record the following case in which menstruation occurred normally from one half of a uterus septus while an intermittent hæmatometra recurred in the other.

Miss C., æt. 24, I first saw in November 1895 when she complained of an intermittent pain in the right side and of irregular hæmorrhages. Her history at that time, so far as it was imperfectly ascertained, was that she commenced to menstruate at the age of 16, and since then she had been perfectly regular up to the present time—every twenty-eight days for from three to four

days, the discharge being somewhat excessive and accompanied by a certain amount of pain. There had been considerable leucorrhœa for some time and occasional hæmorrhages, which at first I understood occurred at the menstrual period. She had had one ten days before I saw her.

She was admitted to St Luke's Home, and on vaginal examination the uterus was found enlarged, the walls seemed thickened, and the cavity measured three inches. I came to the conclusion that the patient suffered from an early fibroid condition of the muscular coat of the uterus, and an accompanying endometritis. On this diagnosis I resolved to curette the uterus, and the operation was performed on 1st December 1895.

In due course the patient left the Home feeling then perfectly well. After three months she returned and complained that although she had had no further hæmorrhages the pain in the right side had returned, and was increasing just as it had done so often before. I then went more carefully into the history of the pain, and ascertained that for six years she had suffered from a pain in the side—attributed by her to a blow from a book—which was relieved only by a hæmorrhagic discharge which occurred about every four months. It was also discovered that after a hæmorrhage the pain practically disappeared for a few weeks and then set in and got worse and worse until once more relieved by the flow from the vagina. Further, besides this gradually increasing pain, the patient every month for a day or two between two of her normal periods suffered from an acute exacerbation of pain and felt as if she were to be unwell, but there was no external sign of menstruation until after four months had elapsed, when a "hæmorrhage" did set in. She also described this discharge as not being like pure blood or like ordinary menstrual fluid, but, to use her own words, "more like brown paint," and it had never been coincident with the menstrual epoch but had always come on some days after the regular discharge had ceased. The abnormal discharge generally continued for about three weeks.

On examination at this time, three months after the date of curettage of the uterus, there was to be felt a marked bulging in the right fornix, and a distinct well-defined fulness in the hypogastric and the right iliac regions. On noting this, the patient told me that she herself had always observed a swelling in the right side before a hæmorrhage came on, and assured me that it disappeared when it set in. She was kept under observation for six weeks longer, and during this time the pain in the side gradually increased, as did also the size and tenseness of the pelvi-abdominal swelling, till both were greater than ever before. The diagnosis was still doubtful, as to differentiate between a sessile ovarian tumour and a dilated tube, which were then the alternate diagnoses, was extremely difficult. At this time, as afterwards, I was greatly assisted by Dr Haultain, who kindly

saw the case with me, and ultimately we resolved to aspirate, per vaginam, the tumour so as to clear up the diagnosis if possible. On April 15, 1896, this was accordingly done. The fluid which escaped was of a dark chocolate-colour—indeed just like altered menstrual fluid—and on submitting it to Dr Noël Paton, he reported that the fluid contained chiefly altered blood corpuscles and some pus cells. After careful consideration, from the history of the case, and from the nature of the fluid, it was concluded that the patient was suffering from retention of menstrual fluid in one half of a double uterus, and that this half had only an imperfect communication with the common cervical canal. Probably every now and again the obstruction was overcome, and the patient for the time being relieved of her symptoms. She happened to see the aspirated fluid, and at once said it was of the same nature as that which she passed about every four months.

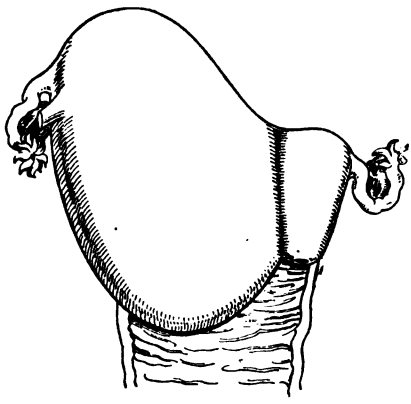


FIG. 1—Showing the normal and the dilated half of the uterus.

Miss C. was now discharged from the home, the pain and swelling having disappeared, but reported herself every fortnight until June 10th, when she was once more admitted with a recurrence of all her symptoms except the hæmorrhage, which had not come on since the aspiration of the swelling. On examination, this was found to have recurred as before, and was bulging downwards into the vagina as well as being easily palpable through the abdominal wall as before.

On 27th June, the patient was anæsthetised, and I first made an incision into the tumour per vaginam, and at once introduced a finger through the opening into a cavity about the size of that of a large cocoanut.

The interior surface at first felt absolutely smooth, but on withdrawing my finger and allowing some of the chocolate-coloured fluid to escape, and then re-introducing it, the cavity seemed much smaller, and the walls corrugated and irregular. On thoroughly washing out the fluid and again exploring the cavity, it became evident that one was dealing with a horn of a double uterus, and the diagnosis of hæmatometra was confirmed. Further, on passing a sound into the single cervix and onwards into the left half of the uterus, and a finger into the sac just opened, the separation between the two halves at the level of the cervical canal was found to consist of a moderately thin structure,

and with little difficulty the sound was forced through the septum, the object being to restore the communication between the two parts. The opening was enlarged by a pair of curved dressing forceps, and, thereafter, a drainage tube inserted. Finally, the opening which had been made into the swelling in the lateral fornix was sewn up with catgut so that all discharge should take place through the tube inserted through the cervical canal.

For some days the retained altered menstrual fluid continued to discharge through the tube, and the cavity was regularly irrigated, but this seemed to get less and less daily, until no swelling could be felt through the abdominal wall.

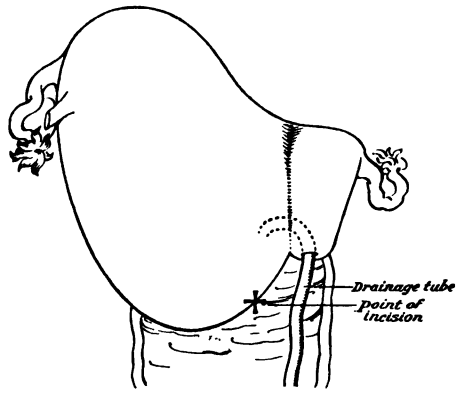


FIG. 2.—Showing point of incision and drainage tube.

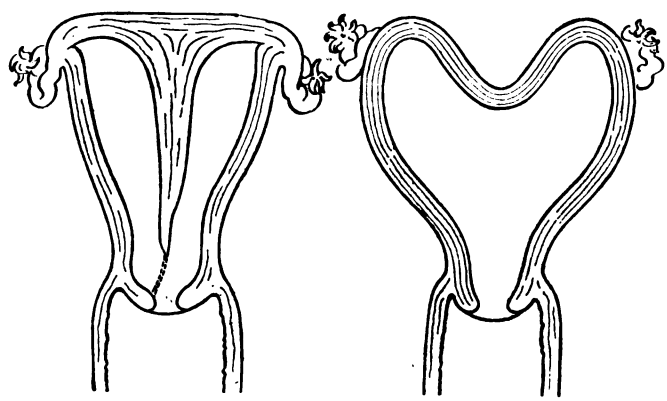
In the course of a week the patient seemed perfectly well, and complained of absolutely no symptoms. She remained in the Home for some weeks under observation, and from time to time the tube was changed and bougies passed along the cervix and into the right horn of the uterus so as to ensure that the opening was patent.

The patient's menstrual history after the operation is extremely interesting. Ten days after it she menstruated, and she observed that the period was what was her normal flow, and that none escaped through the drainage tube which had been left protruding beyond the vulva. Exactly a fortnight later she menstruated again, but this time the fluid escaped entirely through the tube, and, therefore, came from the horn which had been the seat of hæmatometra. This period was not so great in amount as the previous, but was accompanied by more pain. A fortnight later she had her normal period, somewhat excessive, and fourteen days later still, she menstruated again through the tube. I have no reason to douht the patient's statements on this point as she was a trained nurse, and unusually intelligent, and volunteered the information. She left the Home in the end of August to report herself in two months, aud in the middle of October she wrote me from Banff that she was very well, bnt still menstruated every fortnight, alternately from the tube and *per vias naturales.*

I regret to say that immediately after this she developed an attack of acute rheumatism with severe cardiac complications—apparently both pericarditis and endocarditis—to which she succumbed in the beginning of November. Dr Donald of Banff, who attended her in this illness, kindly informed me that death

was sudden, and, in his opinion, due to pulmonary embolism. During her illness she menstruated and complained of more pain than usual, but there seemed to have been nothing in her pelvic condition to hasten the unfortunate result.

It seems to me that this case possesses several interesting features. There is no doubt that this girl had a double uterus, and that one half had a very imperfect communication with the cervical canal. It is probable that the half, which afterwards became dilated, did not begin to function till later than the other, for Miss C. stated that for three years she menstruated quite normally, and it was not till she was the age of eighteen that she began to complain of the curious hæmorrhages from which she suffered. When first I saw her I mistook the nature of the case entirely, and this is partly explained by the fact that shortly before this she had a "hæmorrhage," so that the horn had become quite small. The operation of curettage seems to have effectually closed up the communication between the two parts of the uterus, for after it she was longer without a discharge of the "brown paint" like fluid than ever before, and the pain and swelling in the right side were greater than she had ever observed. The apparent alternate menstruation from the two horns is also interesting. The "hæmorrhages," which she complained of, were never coincident with the normal flow, but occurred ten days or a fortnight later, when the horn was threatened with still further distension from a fresh accumulation of retained fluid, and later, after operation the patient herself observed the alternate flow every fortnight from the vagina and from the tube I had inserted into the formerly dilated horn. This alternate menstruation occurring in cases of double uterus has been noted by especially Kussmaul, Emmet, H. F. Walker, and Aikman.



Uterus Septus. Fig. 3. Uterus Bicornis.

The diagnosis was difficult, and even now it is impossible to say what the exact condition of the uterus was, but there is no

doubt that the uterus was divided. I have used the word "horn" loosely; it was not, however, possible clinically to detect any space or depression at the fundus between the two parts as is usually the case in the "uterus bicornis," so that I am inclined to consider the case rather one of "uterus septus," in which there was no external sign of the congenital malformation (Fig. 3.). When I saw the case at first, the uterus merely seemed hypertrophied and especially large transversely. The septum, as found at the operation, was well marked, thick, and muscular, but less so in the cervical region through which I forced the sound. It may be urged that the case may have been one of hæmato-salpinx, but an extra-uterine pregnancy is entirely out of the question, and it was not an effusion of blood into the lumen of the tube from any other cause. I am well aware that some cases have been recorded in which a supposed dilated tube has proved, post-mortem, to be a distended horn of a double uterus, and *vice versâ*, but it was in this case possible to determine that the walls of the sac were uterine and not tubal. When the Fallopian tubes dilate, the walls invariably become thinned, whereas when the uterus expands from any cause—be it an embryo sac, retained fluid, or a myoma—the walls hypertrophy. In my case, on introducing my finger into the sac, one was struck with the marked thickness and muscularity of the walls, so that it is quite certain the condition was uterine and not tubal.

I may mention that there was no abnormality of the vagina or external organs of generation.

With regard to the literature of this comparatively rare condition, I would chiefly refer those interested to the paper by Dr Cullingworth, read before the American Gynæcological Society in 1893. In this he has collected and given in detail all the most striking recorded cases up to that time. They are nineteen in all, and are cases of retention of menses in one-half of a "double uterus," and I have appended a list of them to this paper. Since 1893, four cases have been recorded, and are also appended here, all of which presented features similar to those which I have described,—namely, the phenomena of "free menstruation + those of retained menstruation," and it is to be noted that the mortality following the operation for relief of this condition is very great. Of the recorded cases, 50 per cent. died—all from peritonitis following the operation. In most, the diagnosis was made only after opening the abdomen, and later, the retention of fluid was dealt with per vaginam.

In some, merely an opening was made into the sac with subsequent drainage, while in others the cervix was so divided as to communicate freely with both the normal and the abnormal half of the uterus. One can see that in the procedure adopted in my case, there was some risk of imperfect drainage of the lower end

of the sac and possible pyometra, but fortunately this did not occur and the vaginal bulging entirely disappeared.

In conclusion, I wish most gratefully to acknowledge the valuable advice and assistance I received from Dr Haultain, both in the diagnosis and the management of the case.

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16. CULLINGWORTH.—*Am. Journ. Obstet.* N. Y., vol. xxvii. p. 817.
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18. BURTON.—*Liverpool Med.-Chir. Journ.*, vol. xiv., p. 459.
19. CALMAIN.—*Prag. med. Wchnschr.*, 1896, s. 2137. (Alternate menstruation).
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21. WALKER.—*Am. Journ. Obstet.*, vol. viii., p. 515.

Dr Haultain congratulated Dr Lackie on his lucid description of this most interesting case. Having been fortunate in being associated with Dr Lackie in the observance of the patient, the paper was to him particularly interesting. He had nothing to add, but could only corroborate every detail which had been described. Perhaps the point of greatest interest was the occurrence of menstruation from each half of the uterus at different periods. This undoubtedly increased the difficulty of diagnosis, as one would naturally expect in a hæmatometra to have the pain of distention of the uterus coincident with menstruation. The history in this case, however, closely simulated that of hydrops tubæ profluens, as described by Croom in his paper read before the Society on the

Mittelschmerz. He only regretted that, as the patient had died, a post-mortem examination had not been made.

Dr Berry Hart remarked on the interest of the paper. Dr Lackie had also recorded it very well. Developmentally the septum of the uterine portion of the Müllerian ducts had evidently persisted. The cervical atresia could be explained as follows:—At or about the fourteenth week of fœtal life the lumen of the Müllerian vagina and lower part of the cervix becomes blocked with cells derived from the Wolffian ducts. These normally break down in the centre, and form the permanent lumen. The failure to do this is apparently the cause of the atresia, which in this case was limited to the cervix of the right uterus.

Prof. Simpson remarked that Dr Lackie's communication was a very valuable addition to their Transactions, because the condition was one of great rarity, and the demonstration had been so complete of the alternate menstruation from the two halves of the uterus.

Dr James Ritchie said that it was not yet known by what nervous mechanism there are regulated uterine contractions and also the ripening of ovarian follicles. It has been supposed that these are under the control of ganglia in the uterus itself, similar to those in the heart wall. In Dr Lackie's case is it possible that there were two ganglia, one in each side, which acted independently, and induced the flow at separate times?

Drs R. C. Buist, Barbour, and *Fordyce* also spoke.

Dr Lackie, in reply, said that he could not explain why it was that only every four months a discharge occurred from the right half of the uterus, but he supposed that the opening between the dilated horn and the cervical canal was so small that it required considerable distention to force it. He was much interested in Dr Berry Hart's remarks on the development of the condition, and grateful to Dr Barbour for his hints as to the accuracy of the diagrams shown. He begged to thank the Society for the kind way in which his paper had been received.

VI. A CASE OF EXTRA-UTERINE GESTATION.

By C. F. A. Moss, M.B. C.M., Medical Mission Hospital, Antananarivo, Madagascar.

(Communicated by Dr A. H. Freeland Barbour.)

A case of extra-uterine gestation has again come to our notice, of which the following are briefly the particulars:—The patient came to my out-patient clinique on 8th October 1894 with a history of amenorrhœa, abdominal tumour with much pain, pain in rectum, especially on defæcation, which is accompanied with the passing of a good deal of mucus and blood. She said she was not

pregnant. Examination, however, at once detected the fœtal head between the rectum and vagina, protruding into both, and the fœtal heart was heard. She came into Hospital on the following day. On October 29 there was a false labour, with passage of decidua. She left Hospital on November 12, fairly strong, and without pain. On January 10 of this year she returned, complaining of intense abdominal pain and menorrhagia. On February 5, being three months from date of false labour, laparotomy was performed, and a female child extracted. The patient made an excellent recovery, and returned home on March 5.

Such are the leading facts of the case. It will be well now to go more fully into detail regarding them.

History.—The patient, as first seen, was a very tall, thin woman, 39 years of age; her face appeared anxious and somewhat worn as if with pain. Her family history is very good. She herself has enjoyed fairly good health. She has had three pregnancies; her second child, aged 20, is living; the first miscarried at seven months; the third was an early abortion, which took place in 1880. She has thus been fourteen years without becoming pregnant. Her menstruation is said to have been normal, with the exception of occasional slight pain, but she says that sometimes a fleshy mass was passed at the period. The history of her present illness is that amenorrhœa has been complete for six months; the last period (in April) was very scanty, and stopped after two days. She seems to have had a bad attack of pain then in the hypogastric region and in the rectum, so severe as to cause fainting. This was followed by frequent tenesmus, often without passing anything, or else only passing thin stools. After a short time she recovered, and for four months had but little pain. An abdominal tumour was then noticed, first in the middle line, she says, and then going over to the left side; from that time there have been attacks of pain, accompanied by some difficulty in micturition, and latterly for six weeks there has been diarrhœa (four to ten motions a day), with bloody stools and much straining. She says she experienced much flatulence, even after taking very little food. So much for the history. The pain and fainting seem to have occurred early in April, when she would probably be just over two months pregnant, although she had no suspicion that such was her condition.

Examination.—On examination I found well-marked pigmentation of linea nigra and breasts, the latter being enlarged; the lower part of the abdomen was filled with a tumour, which extended on the right side to about 2 inches above the umbilicus, and on the left to a slightly lower level. The swelling bulged into each flank. On the right side it was tense and uniform in consistency, and no contraction was detected in it. On the left side, however, the swelling was irregular in consistency; just at the side of the umbilicus there was a rounded bulging, harder than the rest of the swelling, and below it, nearer the pubes, was another, separated

from the first by a narrow sulcus; in these there were occasional and very well-marked contractions. It was doubted whether slight contractions were not felt over the whole of the left side. Slight fœtal movements were felt, which the patient said were more painful than she had experienced in former pregnancies. On auscultation the fœtal heart was heard about its normal position on the left side beating at the rate of 160. The mother's pulse was 52. Per vaginam a hard, round bony mass was felt pushing forward the posterior vaginal wall, and only the length of the terminal phalanx from the ostium vaginæ. It so displaced the vagina that only one finger was admitted. The cervix was reached with difficulty, being pushed very high up; the os was directed anteriorly. During examination a contraction occurred, and the lower supra-pubic bulging alluded to above seemed to be of the exact shape of a slightly enlarged uterus. Per rectum the rounded bony swelling was very evident, separated by very little tissue from the finger, and the sagittal suture was plainly detected. The head, in fact, so filled the rectum as to leave properly formed stools no room to pass.

Diagnosis.—The diagnosis of pregnancy was perfectly clear, but there was doubt as to whether the case was one of extra-uterine gestation, to which the history and the physical signs seemed strongly to point, or whether it was retroflexion of the gravid uterus, which the contractions that were supposed to be detected over the whole of the left side seemed to point to, although there was absence of such a history or of such bladder trouble as one would have expected.

Progress.—That was the state of the patient on admission to Hospital on October 9. She was carefully watched and examined, and between that date and the occurrence of her false labour the following observations were made:—The pain continued very severe, although it was kept under control by treatment; it came on in paroxysms, chiefly to the left side of the umbilicus, varying from day to day, being now better and now worse; occasionally there was sickness and retching, and the nights were often disturbed. The fœtal heart was heard on the 15th beating at the rate of 134, but on examination on the 19th it was not discovered, although the patient said she still felt the fœtal movement, only less forcibly than before.

On the 23rd, the question of diagnosis not being considered to be definitely settled, it was decided to give chloroform, and endeavour to push up the child gently. But very little force could be used, as the head was so near the finger in the rectum that pressure would have injured the bones. Some very slight change in position was effected, and it was noticed afterwards that the stools were better formed and larger. The pushing up of the head did not inspire one with much confidence as a mode of treatment, on account of the dread lest the case might be one of extra-

uterine gestation, and a rupture of the sac thus follow the attempt. The contracting body above the pubes also seemed as if it must be the empty uterus, as it was so distinct and separate from the rest of the abdominal swelling, and it was in a direct line with the os uteri. Following the attempted replacement there was much tympanitis, with great tenderness over the upper part of the swelling on the left side. The temperature was unaltered, being just about normal. The pulse varied from 84 to 92 per minute, and there was no change in these resulting from the pushing. On the 27th the patient said she still felt fœtal movements, but the heart was not heard.

False Labour.—On the 29th the tympanitis in the epigastrium was extreme, and pain very severe; the patient was sitting up and in great distress; the os uteri was found more patulous than before. That night an apparent cast of the uterus came away unbroken; it was thick and fleshy, the inner surface quite smooth, and the outer rough and shaggy. It was accompanied by a little discharge of blood, with pain in the back and hypogastrium. The symptoms decreased in severity after that, and by the 1st November the chart records less pain, more sleep, and better appetite.

The os was still dilated, and there was slight discharge. Contractions were still noticed above the pubes.

There was but little alteration in the abdominal tumour, but by the 11th November, just before she went home, it was noted that there was "much less pain, no tympanitis, decrease in swelling to left of umbilicus, with greater ease in feeling child." The head protruded less into the vagina and rectum, and the stools were larger. Contraction was still felt, however, going on in the uterus.

No mention has been made of treatment. Sedatives, carminatives, and stimulants were administered as occasion required, and local treatment by fomentations, enemata, etc., also carried out.

Condition after Death of Child.—From the time the patient passed out of close observation until January 10, when she returned to Hospital for further treatment on account of her severe pain, she had menstruated rather profusely and very painfully, and the flow had lasted several days.

On examination the right side of the tumour seemed to have increased in size, and appeared like a tense cyst; the upper limit was sharper than before, and very painful. On the left side there was less pain, and bones were felt, especially a small long bone near the umbilicus. The upper limit of the tumour was pretty much at the same level as before. Per vaginam the head was felt less rounded and protuberant than formerly, and there seemed to be more tissue between it and the fingers examining.

The cervix was, as before, very high up and difficult to reach, but it was more anterior.

The bowels were irregular, but generally constipated. The temperature varied between 98° and 100° F., and the pulse between

88 and 100 (usually 96). The pain was sometimes exceedingly severe; it was felt principally along the upper limit of the swelling. The appetite was bad, and there was occasional vomiting. The patient was carefully watched until the beginning of February, when the period was expected again, and the intention was to operate as soon as that had stopped. It, however, did not appear, and the pain was at times so bad that we decided to operate on February 5. The bowels had been copiously moved for some days previous to that date.

Operation.—The usual preparations were made, and patient, operators, nurses, instruments, etc., all subjected to careful cleansing. I was kindly assisted in the operation by Dr Wm. Wilson, and the nursing arrangements were skilfully carried out by Miss Byam.

An incision was made in the middle line of the abdomen below the umbilicus for about 4 inches. The abdominal walls were very thin. On entering the peritoneal cavity the sac was seen smooth, shining, and covered with peritoneum, rather blue in colour, and very similar to an ovarian cyst. It stretched from side to side of the abdomen, and there were a few adhesions to omentum, but none to the anterior abdominal wall. At the lower part of the wound, and between it and the sac, the uterus was found directed slightly to the left, free from the sac and about normal in size. A hypodermic needle was introduced into the sac, but as nothing came through it, a long mesial incision was made through the thin wall, opening immediately on to a large and fleshy placenta, which, however, did not bleed. To make the operation as much as possible extra-peritoneal, the sides of the incision into the sac were stitched to the sides of the abdominal incision, a precaution which afterwards proved to have been unnecessary. The inside of the sac was then examined. The right side was found entirely occupied by placenta, and on the left was the child, head downwards and feet directed towards the incision. They were grasped, and the child was soon delivered. It was a female child, full-time, but now much shrivelled, and the epidermis was peeled off in parts. The back of the head was very much elongated and flattened. The placenta was then carefully examined, when it was found that though the sac wall was accurately moulded on it, it could easily be separated therefrom. It filled the whole of the right side of the sac, coming even to a little to the left of the middle line, and was folded on itself from before backwards. It was too large to admit of removal entire, and so was broken up and removed in three or four large pieces. Its texture was very close, its size probably half as large again as an ordinary placenta, and its thickness 3 or 4 inches. Its substance did not bleed. During its removal, however, it was found that there was a rent in the posterior wall of the cyst on the left side, through which bowel and omentum prolapsed; the latter was adherent to the under side

of the placenta. There was a thick-walled ruptured sac inside the original sac and situated at its lower part behind the uterus. Its position would be close to the lower part of the under side of the placenta; but the placenta having been removed, it was impossible to at all determine what the original relations of the two might have been.

The endeavour was made to cut it away, but there was so much oozing from its fibrous walls that the attempt was relinquished.

The abdominal cavity was then washed out with boiled water, and one or two clots removed.

The abdominal incision was then closed with silkworm gut sutures, but a drainage-tube left at its lower part. The wound was dusted with iodoform and dressed with iodoform gauze. Strapping was placed above from side to side of abdomen.

Progress.—The patient was removed to a bed in the ward in which the operation had been performed. She vomited a good deal on the day of operation. Rectal injections of hot water were employed, and in the evening injections of chicken broth. On the third day she was given and retained a little liquid food by the mouth. The dressings required daily changing until the third day, when the tube was removed. The stitches were removed on the ninth day, the wound being then healed, except where the tube had been inserted. The patient's general condition was good. The pulse was between 90 and 100; the temperature below 100°, but it rose daily to 101° or 102° from the sixth to the tenth day, when it was checked by quinine. There was occasional pain in the left iliac fossa, invariably removed by an enema.

For some time there was inflammatory swelling over the sac wall, chiefly in the left iliac fossa, which was hard and painful, but tympanitic. This swelling gradually went down, and after three weeks was barely noticeable.

Examination per vaginam, four weeks after operation, showed the cervix uteri directed posteriorly, and easily reached by the finger. The uterus was anterior and hard, and a trifle larger than normal. The lateral fornices contained some slight indefinite thickening. There was no pain on examination. The patient went home four weeks after operation, and continued to gain strength and flesh, recovery being perfect.

Remarks.—The sac seems to have been formed by great distension of the posterior layer of the broad ligament. There is reason to fear that the rupture may have been due to the attempted pushing up of the child under the mistaken idea that it *might* possibly be a retroflexed gravid uterus. This undertaking is to be regretted. Symptoms of pain in the left side of the sac at its upper part followed this, and there was also much tympanites for some days. It was about that region also that there was frequent pain after the death of the child. There was no liquor amnii in the sac at the time of operation. The circulation in the placenta

was found to have stopped on operating one hundred days after the false labour. The increase in size of the tumour in the right iliac fossa appears to have been due to the increased growth of the placenta, which organ, as has been said, exactly occupied that position; and its size, although unfortunately no absolute weight or measurement was taken, was certainly larger than that of the normal placenta.

The temptation to remove the child per vaginam was very great, but the sudden failure to detect the fœtal heart fortunately prevented any further thought of so doing. Thus it was decided that waiting till the placenta might be expected to have dried up was the proper mode of treatment, the patient meanwhile being kept under observation in case of dangerous symptoms developing. It is interesting to note that this is the fourth case of advanced extra-uterine gestation that has come under my notice in this city. Two are recorded in the *Edinburgh Medical Journal*, November 1894, and another was diagnosed in the out-patient clinique owing to the shape of the abdominal tumour (very broad from side to side) and the utterly unlimited nature of the fœtal movements, which were very distinct. The diagnosis has been verified by the fact of the woman not having been yet delivered, although it is more than four years since she was examined. We have heard of her, but not seen her since then.

P.S.—Since the above was written, two more cases have come under my notice.

One was that of a girl about 20, nulliparous, who was treated in hospital after rupture of the sac at about five weeks. The child grew until the fourth month, when fœtid decidua was passed, with symptoms of false labour. After a month we were proceeding to operate on account of pain and continued fever, when the patient suddenly expired under chloroform. Only 2 drachms had been administered, but death was instantaneous, no attempt at restoration proving of the slightest avail.

The other case was one of abscess opening through the abdominal wall, and prolonged discharge of bones. The patient was seen by one of my pupils, but she refused operation, and did not return; and it was afterwards ascertained by him that the issue had been fatal.

(The discussion of this paper was postponed till after the reading of the next.)

VII. LAPAROTOMY FOR EXTRA-UTERINE GESTATION TWO AND A HALF MONTHS AFTER THE DEATH OF THE FŒTUS AT FIVE AND A HALF MONTHS.

By A. H. Freeland Barbour, M.D., F.R.C.P.

The greater rarity of cases of operative interference at this period of extra-uterine gestation, and the points raised as to time and mode of operating, make the following case of interest:—

Mrs A. B., æt. 32, was sent in to Ward 28 by Dr C. L. Fraser of Berwick in August last, complaining of swelling of the abdomen and pain in the right leg. Her previous history, per Dr Eyre's report, is as follows:—She began to menstruate when 12 years of age. She was perfectly regular till at 17 she became pregnant. Her periods usually lasted four or five days. After the child was born she settled down again to her former regularity, and remained regular till her marriage, which took place two years ago last January. Two months after marriage she ceased to menstruate, and in the following June had a miscarriage.

Eight or nine months later she had another miscarriage. Both miscarriages occurred at or about the third month. After this she was regular again till January 1896. On the 27th of January there was a discharge of blood, which the patient considered a normal period. On the evening of the 7th of February, as patient was sitting at the fireside, the work of a by no means laborious day finished, she was suddenly seized with a feeling of sickness, accompanied by pain in the right side, followed by vomiting. She was put to bed; the slightest movement of the right leg caused her great pain. The doctor was sent for. He ordered poultices, and prescribed pills, which deadened the pain. Patient remained in bed a week, still troubled by pain, and occasionally vomiting. During the next three weeks patient got about a little. Then suddenly an attack, in all respects coinciding with the first, even to the hour and mode of onset, struck her down again. It ran a course similar to the first attack. As before, she recovered sufficiently to go about her daily duties, never feeling quite herself, and always pulled up by pain in the side whenever she attempted to exert herself.

At this time, owing to the amenorrhœa and a gradually enlarging tumour in her abdomen, patient thought that she was pregnant.

In February, after the first of the above described attacks, a tumour the size of a hen's egg appeared in the right iliac region, and went on gradually increasing in size. In March she noticed a swelling in the left hypochondrium, which grew downwards. In May she felt quickening in the latter swelling, and then made certain that she was pregnant. Movements were felt for about three weeks; she did not feel them after the attack on June 18. On June 18, at 1.30 in the afternoon, as patient sat sewing after

dinner, she turned giddy, vomited, fell unconscious to the floor, and remained oblivious to her surroundings till 8 o'clock in the evening. From that day till the day of her admission to the Infirmary she kept her bed, now better, now worse, exacerbations of the pain being accompanied by vomiting. The two swellings referred to increased during these two months. A day or two after this attack a pale bloody discharge escaped per vaginam containing shreds like skin. A similar discharge took place just before her admission. Neither lasted more than three days, and the amount of discharge was on both occasions small. Micturition normal. Abdominal examination revealed a large tumour, irregular in outline, reaching to within an inch of the umbilicus. On the left side it extends to a point 3 inches from the middle line; on the right it fills up the iliac fossa. It is dull on percussion; solid at some points, cystic at others.

There is a well-marked linea nigra.

Per vaginam a large mass can be felt bulging into the posterior fornix; in the right fornix a small nodular body about the size of a hazel-nut is felt. The uterus is to the front, and apparently continuous with the tumour.

September 11.—The patient having recovered from an attack of severe pain, and the tumour having increased in size, suspecting a hæmorrhage to have taken place, I cut down. The abdomen having been opened, a tumour was found extending upwards into the right hypochondriac region, the uterus lying in front of it, apparently not enlarged, just behind the right pectineal eminence. The tumour was covered with peritoneum of a dark colour, and was of boggy consistence. It was free in front and at the left side, but above was adherent to the omentum, while the peritoneum was lifted up in the right iliac fossa. Below it extended into the pelvis, the peritoneum dipping down between it and the fundus uteri for a short distance. The sac was stitched by interrupted sutures to the abdominal incision. Two silk ligatures at each end of the abdominal incision were also passed through the sac wall, and by means of them the sides of the incision were drawn in at its two extremities.

The sac, being now shut off from the peritoneal cavity, was tapped, first with an aspirator, but no fluid escaped, then with a knife. The sac wall was thin and pliable. Firm blood-clot was first encountered; this was lifted out in large dry lumps. From the lower part of the sac lumps of placental tissue were removed, also dry and bloodless. Deep down in the pouch of Douglas recent blood-clot was found and removed. At the upper part of the cavity which remained after removal of the clot and placental tissue the limbs of a fœtus were found. Traction was made upon these, and a mummified fœtus covered with a yellow vernix caseosa was extracted with some difficulty. The fœtus was lying in a large diverticulum, which extended up into the right hypochondrium,

and formed the upper portion of the abdominal swelling; the secondary sac seemed to be intra-peritoneal; the rest of the placental tissue was carefully removed, and the whole cavity washed out with a weak antiseptic. There was a little bleeding, which was easily controlled, and both the cavities were packed with iodoform gauze. The abdominal incision, with the exception of two inches about its middle, was then closed.

The fœtus was mummified, measured 12½ ins. in length, and to all appearance had been dead some time.

September 14.—Gauze was removed and the sac washed out with weak boracic (1–40), and a drainage-tube inserted.

September 30.—Since 14th, cavity has been washed out twice daily and tube shortened.

For the two days following the operation the temperature varied from 99° to 100°·2, and pulse from 92 to 110. On the third day the gauze was removed, the sac washed out with weak boracic (1–40), and the drainage-tube inserted. On the four following days the temperature ranged from 98° to 100°, and the pulse from 82 to 96. After this there was slight rise in temperature for a week, and subsequently nothing worthy of note in her general condition. During the following month the sac was washed out with boracic, and sometimes with iodine, and contracted to a mere sinus, which closed shortly after the patient went home in the beginning of November. By bimanual the uterus was found to the right and front rather higher in the pelvis than usual, but freely movable. No deposit was recognisable per vaginam, but there was an indistinct fullness felt by abdominal hand over the cicatrix.

This is a case of extra-uterine gestation which had gone on to the fifth and sixth month, as shown by the length of the fœtus (12½ ins.) and the fact that fœtal movements were felt for three weeks. The hæmorrhage mentioned at the end of January was not menstrual, as the first symptoms of rupture occurred a fortnight later. These had the usual character of being sudden, unprovoked, and abdominal. Vomiting during the first and subsequent attack (three weeks later) was marked, as it is occasionally in cases of extra-uterine gestation, which makes them resemble irritant poisoning. The cause of vomiting is not clear. To say that it is reflex does not explain it, for it is not evident why hæmorrhage into the pelvic cellular tissue or peritoneum should in this special instance excite it. This clinical fact is of the first importance; it diverts the attention from the pelvis to the epigastric region, and leads to such cases being diagnosed and treated as irritant poisoning.

The patient was able to go about, and the case was considered one of ordinary pregnancy until the violent onset of symptoms, when she was apparently between the fifth and sixth month, from which she never entirely recovered until the operation. It is inter-

esting to note that the birth of the fœtus was associated with the symptom of considerable internal hæmorrhage.

This case raises two points of importance with regard to treatment, viz., the best time for operating and the mode of treating the sac. While there is difference of opinion as to the desirability of immediate operation in cases of rupture during the early months, it is generally accepted that in the later months, if the fœtus is dead, we should wait for a certain amount of atrophy of the placenta. I say, if it is dead, for if it is alive the question of interfering in its interest is still *sub lite.*

While there is agreement as to the advantage of delay, there is a divergence of opinion as to how long we should wait, some advising one, others three months, while others would postpone it till symptoms calling for interference arise.

The cases of laparotomy during the later months of extra-uterine gestation—that is to say, after distinct evidence of the life of the fœtus, from 4½ months onwards—are not so frequent as one would imagine. From our own *Transactions,* with the help of Dr J. W. Ballantyne's valuable index, I have collected only seven—recorded by Drs M'Dougal, Freund, Angus Macdonald, Moss, Underhill, Halliday Croom, and myself. The period at which the operation was done varied from five days to six months after the death of the fœtus. Dr Morrison's case, reported by Dr Underhill, in which the operation was done seven days after, and the patient died from hæmorrhage through the placenta being cut into, shows the danger of too early operation; while Dr Angus Macdonald's case of laparotomy six months after its death, and where a fæcal fistula had formed communicating with the sac, shows one drawback to postponing interference too long. The immediate reasons for interference may be given as—pain, sepsis, and hæmorrhage.

Pain by itself is rare as an indication; it is almost always combined with sepsis, as in Angus Macdonald's case. Sepsis, which generally appears in the records as feverishness with gradual emaciation, furnishes, as one would expect, in almost all the cases, the indication for operative interference. Including the two cases brought before you this evening by Dr Moss and myself, we have eleven, in only one of which, namely, my own, internal hæmorrhage was the reason. This case, therefore, brings out the fact that, against the greater safety from placental hæmorrhage gained by waiting, we must set a risk arising to the patient from internal hæmorrhage. By placental hæmorrhage I mean hæmorrhage due to cutting into the placenta in opening the sac, or due to detachment of the placenta. It is not evident where the bleeding came from in this case, as the portions of placenta removed were not vascular. There may have been a portion deep down in the pelvis which retained its vascularity, although there is no distinct proof of this.

As regards the treatment of the sac, I attribute the result in this

operation largely to the careful stitching of it to the abdominal incision *before* cutting into it. By so doing, the operation was made practically extra-peritoneal, the advantage of which was referred to by Dr Halliday Croom in his recent paper. By this procedure I was able to use freedom in evacuating the contents of the sac and in washing it out, without any fear of matter escaping into the peritoneal cavity. Further, the stitching of the sac to the abdominal wall was more easily done than after evacuation of the contents, when the ragged, friable margins of the sac are stitched with difficulty, and often hurriedly to complete the operation.

In the discussion on the treatment of extra-uterine gestation at this period before the London Obstetrical Society, Dr Herman and Dr Cullingworth both held that the ligature of the sac to the edges of the abdominal incision was unnecessary, the latter stating that "the custom was a relic of the traditional dread of the peritoneum, and might be abandoned with advantage." In this one cannot entirely agree with them. And that there is a dread of the peritoneum which is more than traditional, is apparent from Dr Herman's statement that the lymph exuded round the strip of gauze shuts off the general peritoneal cavity quite as well as it would be shut off were the cyst wall stitched to the margin of the wound, and from the care taken to prevent the escape of matter into the peritoneal cavity during the operation. After the operation also we can use greater freedom in removing the packing and washing out the sac (should occasion arise for this) if it has been stitched in the incision. The chief advantage of this method, however, is that it prevents the escape of fluids into the peritoneal cavity *during the operation.*

Prof. Simpson said both of the communications that had been read by Dr Barbour were of the greatest interest. Dr Moss was to be congratulated on having so successfully recognised and dealt with his cases in his mission field. The manner in which Dr Barbour had discussed the proper data and mode of dealing with cases of advanced extra-uterine gestation was very instructive, and would lead to the stitching of the cyst wall to the abdominal cavity as a preliminary to its being opened becoming the established rule of practice.

Dr Haultain thought there were some points which contra-indicated the stitching of the sac to the abdominal wall before incising into it. Firstly, one would require to be absolutely certain of the diagnosis of extra-uterine gestation, which was by no means always possible; and, secondly, the stitching of the sac precluded the idea of removal, a step which was occasionally indicated according to its attachment. Further, severe hæmorrhage from the placental site might be controlled only by ligature of vessels entering the sac wall, and to do this the stitches would require to be removed before attempts at such could be made, and

thus the operation might be unduly prolonged. On the other hand, he fully appreciated the early stitching of the sac to the abdominal wall as of value in preventing the soiling of the peritoneum; and further, as being much easier before incision than after, as from contraction of the sac after removal of its contents he had found approximation by stitches a very difficult matter.

Dr Barbour replied.

MEETING IV.—FEBRUARY 10, 1897.

Dr MILNE MURRAY, *Vice-President*, and afterwards Dr FREELAND BARBOUR, *in the Chair*.

I. The following gentlemen were duly elected Ordinary Fellows of the Society at the Meeting on December 9, 1896:—James Curtis Whyte, M.B. C.M., Dalkeith; Hugh Eyres, M.B. C.M., Royal Infirmary, Edinburgh; G. H. Simla Paterson, M.B. C.M., Glengyle Terrace, Edinburgh; W. R. Martin, M.B. C.M., Weston, Haddington; R. H. Watson, M.A., M.B. C.M., Burnlea, Bent Road, Hamilton; T. M. Callender, M.B. C.M., Inverard, Inverleith Gardens; L. Grant, M.B. C.M., Royal Infirmary, Edinburgh. Elected at the Meeting on January 13, 1897:—Robert Robertson, M.B. C.M., 34 Raeburn Place, Edinburgh; James Wilkie, M.A., L.R.C.P. & S., L.F.P.S., Selville House, Portobello; A. Graham, M.D., Currie; Douglas Watson, M.B. C.M., 19 Rutland Street. Elected at the Meeting on February 10, 1897:—Robert Mair, M.D., Hawick; Roderick M. Matheson, M.B. C.M., 41 George Square.

II. *Dr R. C. Buist* showed A VELAMENTOUS PLACENTA, and gave the following details regarding it:—The placenta, for which I am indebted to Dr Mackie Whyte, who got it at a normal labour in a primipara aged 23, is divided by a well-marked furrow, where the placental tissue is thin but not absent, into two lobes, 9 and 11 cms. broad respectively, and 15 cms. long. The umbilical cord, 55 cms. long, is inserted on the membranes, 10 cms. from the margin of the larger lobe. The vessels break up into three groups, one passes almost directly to the edge of the larger lobe, on the surface of which it is distributed, one running a course of 18 cms. inserted on the further lobe, and the third separates to give branches to each lobe. This last group has the longest branches, one of them reaching the edge of the placenta at a distance 25 cms. from the insertion of the cord. There are several vasa aberrantia, one of which runs alongside of the aperture in the membranes, the direction of rupture of which it probably determined. The rupture of the membranes has advanced close to the root of the cord. The nearness of the vessels to the rupture illustrates the risk of hæmorrhage in these

cases. The subject is fully dealt with in Dr Croom's paper on "Funic Hæmorrhage during Labour" in the Society's *Transactions*.

III. *Dr J. W. Ballantyne* showed—(*a*) AN ANENCEPHALIC FŒTUS, sent to him by Dr J. Lawson Russell of Todmorden. The clinical history of the case was as follows:—Mother, Mrs S., is 37 years of age, thin, but proportionate in development. Her height is 5 feet 4 inches, and her weight about 8 stones, *i.e.*, before this pregnancy began. She was married when only 19 years of age. Her habits and surroundings are those of the lower working class, the house dingy, the locality low lying, and her food consisting mainly of tea and bread and butter. She suffers from no disease, nor does she show any marked diathesis. Her habit as to menstruation was regular, twenty-eight day, lasting four days. After her third puerperium she became somewhat irregular, and on two occasions has parted with uterine casts. Her pregnancies and labours have been as follows:—

1*st*. Boy, born at seven months. Cannot give particulars of labour. Child was very delicate; is now a lad of eighteen years, but is small and miserably developed.

2*nd*. Full-time labour. She says she had at this labour a hard time, but got up about a week after the birth. The child died when seven years of age.

3*rd*. Full-time labour. She had more than usual sickness and vomiting during the pregnancy. Forceps were used at the labour. There was, she states, a large quantity of water. The child died at eighteen months, of "fits."

4*th*. Full-time labour. Again forceps were used, she says, because "she had no pains to bring the child." Child died at ten months.

5*th*. Full-time labour. During the pregnancy she was of such a size that she was thought to be carrying twins. The labour was, so far as can be gathered, natural. Child died at seven years, of "brain fever."

6*th*. Miscarriage at about two months. The ovum was accompanied by a very thick decidual cast, and there was at the time of the abortion great flooding.

7*th*. She menstruated last on May 17, 1896, and the child was born on January 20, 1897. After September '96 Mrs S. looked a most unusual size, and she felt from that point onward greatly burdened, complaining of difficulty of breathing and of inability to move about with any freedom. During November and December those symptoms continued, and she frequently vomited. Early in January (about the 6th) she had great pain all down her right side, and she then suffered from marked dyspnœa and very frequent vomiting. Her abdomen was enormously distended. *P. V.*—The os was distended to size of crown piece, and bag of waters (tense) filling it up. On auscultation the placental bruit

could be heard, but not the fœtal heart-beat. Mrs S., however, felt fœtal movements up to the 18th of January. On the 10th of January the vomiting and the dyspnœa became more distressing, and diarrhœa set in. On the morning of 20th January Mrs S. was helped out of bed to have the bowels moved, and while she was seated over a large pail the "waters broke," and the child was born "without a pain" into the pail, which was quite filled with the waters. Roughly estimated, there must have been about two gallons of water. The placenta was adherent, and on removal, four hours after the birth of child, was found to be unusually small, and to have a shreddy, greyish-white fibroid structure constituting the greater part of its bulk.

Dr Ballantyne had made a vertical mesial frozen section of the fœtus, a female, and this showed the marked cervical lordosis and the consequent sinking of the head on the shoulders, which are so characteristic of anencephaly. The spinal canal was closed below the level of the cervical region, and the cord was present.

(*b*) CONGENITAL FIBROMA OF THE SCALP OF A NEW-BORN INFANT. Photographs of a new-born female infant, the ninth child of healthy parents, whose other children, however, show signs of rickets. The child was born with a finger-like, fleshy growth attached to the right side of the head, midway between the anterior and posterior fontanelles, and a little to the side of the sagittal suture. It was not connected with the underlying bones; it showed a slight constriction at its middle. At the time of birth it was of the size of the infant's thumb. In labour the student in attendance upon the case was puzzled as to the presentation (a vertex) by the presence of what he thought was a thumb. Dr Ballantyne excised the growth when the infant was three weeks old. Microscopically it consisted of fibrous tissue, with a marked growth of sebaceous glands (fibroma molluscum ?).

IV. *Dr Milne Murray* showed—(*a*) AXIS-TRACTION FORCEPS WITH SEPARABLE TRACTION RODS; and (*b*) ADJUSTABLE AXIS-TRACTION FORCEPS, with a new modification of attachment of TRACTION HANDLE.

V. IS THERE A POSITIVE PRESSURE IN THE GROWING PREGNANT UTERUS?

By R. MILNE MURRAY, M.A., M.B., F.R.C.P. Ed.; Lecturer on Midwifery, School of Medicine, Edinburgh.

IT will be within the recollection of those who were present at the December meeting of the Society that a discussion arose on a paper which I then read on Deviation of the Pregnant and Puerperal Uterus. In this paper I tried to prove that rotation and consequent deviation were almost a physical necessity of the growing uterus on account of the structure of its muscular wall.

The explanation offered assumed that the expansion of the pregnant uterus in the abdominal cavity was associated with a certain tension of the uterine wall caused by a rise in intra-uterine pressure. In other words, the uterine walls were assumed to be kept tight over their contents. The *amount* of internal pressure was regarded as insignificant. The "smallest increase of intra-uterine pressure" was all that I assumed. And what I attempted to show was, that if this smallest increase was admitted, rotation and deviation followed as a physical necessity. Dr Hart did not find himself able to agree with this conclusion of my paper, in so far as the existence of intra-uterine pressure was assumed, mainly because the evidence derived from the examination of some frozen sections seemed to prove that the uterine wall was really flaccid, and lay, as one observer has expressed it, over the fœtus "like a wet towel." I think I am right in saying that Dr Hart did not absolutely commit himself to either view. He suggested that it would be advisable for me to revise my paper, keeping in view the observations to which he had referred, because it was obvious that if this view of the condition of the uterine wall in pregnancy was the correct one, intra-uterine tension could play no part in accounting for mechanical changes in the mass of the uterus and its contents. I had not by any means ignored this view of the condition of the uterus during pregnancy. I had considered it, as I supposed, carefully enough. But I had, in the first place, regarded the mode of observation as fallacious; and, in the second place, could form in my own mind no physical picture of a condition in which the known phenomena of pregnancy were compatible with a flaccid condition of the uterine wall.

My attempts to indicate my position were not considered very successful by Dr Hart, and as the lateness of the hour precluded prolongation of the discussion, I have ventured to ask the Society to allow me to return to the matter to-night, and to state as briefly as I can—

1*st.* The grounds on which I believe there is a certain intra-uterine tension during pregnancy; and

2*nd.* Why I consider the evidence to the contrary as derived from the study of frozen sections to be misleading and fallacious.

The physical relation of the growing pregnant uterus may be best realised by regarding it as a sac, enclosed within a distensible capsule or shell. This capsule or shell is composed of the abdominal walls, including, as well as the anterior and posterior walls, the roof (formed by the diaphragm), and the floor (formed by the "pelvic floor.") The capsule includes, moreover, the entire abdominal and pelvic viscera, which fill the abdominal cavity up to the surface of contact with the uterus. The uterus projects through the floor, and is fixed to it in such a way that it cannot leave the floor, while it is free, under certain limitations, to expand towards the roof. Assuming that the intra-abdominal

pressure is neutral at the commencement of pregnancy, *i.e.*, that if the abdominal walls were punctured (in the erect position) there would be no tendency for air to enter or fluid or viscera to escape, it is obvious that when the uterus began to grow there would arise a necessity on its part to push aside or to lift viscera to a higher level. This must be followed by a gradual increase in intra-abdominal pressure, so that when the uterus had undergone a sensible increase, puncture of the wall in the erect position must be followed by a tendency of fluid contents to escape. This increase in pressure can only be obviated and the intra-abdominal pressure kept neutral on the assumption that the abdominal walls incease in area, by a process of physiological growth *pari passu* with the growth of the uterus, so that the capacity of the abdomen increases exactly as the mass of the uterus enlarges. We must then, in order to determine whether or not the growing uterus causes an increase of intra-abdominal pressure, enquire whether there is any evidence that the abdominal walls are *put on the stretch* during pregnancy. That the anterior walls bulge is obvious; but the question is, does this bulging mean that their tension remains the same as before, or are they bulged under tension by increased pressure behind them? That this tension is increased seems to me proved by the following facts:—

1. In all primiparæ and in many multiparæ the fœtal head is kept in the pelvis by the tension of the resisting abdominal walls.

2. The abdominal walls in the majority of cases feel thinner and tenser at the end of pregnancy than at the beginning of the process. For example, a fold of the tissues can be less easily grasped in the hand as pregnancy advances.

3. The striæ gravidarum and the actual cracks which are sometimes found, show that the tissues of the abdominal walls are rendered tense by late pregnancy.

4. The distress and discomfort caused in pregnant women by even slight degrees of flatulence show that the intestines are compressed and crowded by the growing uterus.

5. The shallowness of the respiration shows that the movements of the diaphragm—the roof of the abdomen—are impeded.

6. "The pelvic floor projection is increased by advanced and even by early pregnancy." I quote from Hart and Barbour's *Gynæcology* (3rd edition, page 66). "This projection might be accounted for by the weight and consequent sinking down of the early pregnant uterus, but in advanced pregnancy the uterus does not bear so low down, and the increased 'pelvic floor projection' is probably a result of increased abdominal tension."

Against these well-known facts I can find no observation which can be placed to show that the intra-abdominal pressure is not raised by the growth of the uterus. To put it another way, the gradually growing uterus has to make its way in all directions

into the abdominal cavity against a gradually increasing intra-abdominal pressure. I do not for a moment deny that there is a certain growth on the part of the tissues of the wall of the abdomen, but I maintain that this is not proportional to the growth of the uterus, and that pressure is thereby increased. But in addition to this steady resistance to the growth of the uterus, which I may term the "permanent intra-abdominal pressure," the uterus, and, of course, the other viscera, are constantly subjected to a pressure varying in amount and duration by changes in their own bulk. These may be regarded as changes in the thickness of the capsule already referred to, which encloses the uterus. Thus each time the bladder fills, the intra-abdominal pressure must be raised in proportion, and the same remark applies to the filling of the rectum, intestines, and stomach. The permanent abdominal pressure is thus increased temporarily by the filling, and again diminished by the emptying of these organs.

Having now tried to make clear my conception of the physical condition of the extra-uterine intra-abdominal cavity, I would now ask you to consider the physical conditions of the growing pregnant uterus.

From the time of early pregnancy the uterus may be regarded as a pear-shaped sac with soft yielding walls, the apex of which is inserted into the comparatively firm pelvic floor. The sac then rests by its apex on, and is tied to the floor. Like the other structures on the floor it is, in the erect position, pressed upon by the intestines, which, though limited in their movements by the folds of the peritoneum, are not in any way suspended by these folds. The intestines may be said to rest on the uterus. Before the commencement of pregnancy the cavity of the uterus is only a potential one—its walls are in close apposition. With the arrival of the ovum it becomes an actual cavity, and by the time it has undergone sensible increase of its size the cavity is lined by a closed membranous sac in which its contents lie.

Now at first it is obvious that the potential cavity of the uterus is much larger than the newly arrived ovum, and that there is no "stretching of the walls" necessary to accommodate it. But that does not mean that the walls are flaccid. They are separated to a microscopical extent by the ovum, but everywhere else they are in contact, and are kept so in some measure by the pressure of the viscera resting on them. Consider the physical conditions under which such a sac as the uterus could increase in size and in its contents without any internal tension. If the cavity of the abdomen were open, and the uterine walls grew in area at a rate greater than the development of its contents in bulk, the condition of a flaccid sac devoid of positive internal pressure would be attained. But under no other circumstances could such a condition be conceived. Fo assume that the walls of the uterus

increase in the pregnant woman at a rate greater than the bulk of the ovum, this increase in the mass of the wall means an increase of intra-abdominal pressure which would keep them in absolute contact everywhere that their contents did not separate them. And any further separation can only be effected by pressure on the part of the ovum greater than that of the extra-uterine region. In the face of such considerations it seems to me self-evident that a positive pressure must exist in the sac of the ovum, otherwise the growth of the sac against the abdominal pressure would be a physical impossibility. Until recently, no one, so far as I know, had any doubt but that the contents of the pregnant uterus filled its cavity, and that the walls were in a sense tight over them. What observations have thrown any doubt upon this view?

1. It has been observed that the walls of the pregnant uterus removed from the body are loose and flabby. But such a uterus is dead—its walls have lost their vital tone, and are like all other dead muscle, relaxed and lengthened. Every one knows that if a living voluntary muscle is cut across, its ends separate. If a dead muscle is divided no such gaping occurs. The living uterus may be tense while the dead is flaccid. Evidence of this sort is of no value. But probably the evidence which has had most effect in changing the opinion of some on this subject is that derived from the observation of frozen sections. But two considerations seem to me of paramount importance in estimating the value of any evidence derived from this source.

1. We are again dealing with a dead body where muscular tissues, external and internal, voluntary and involuntary, are devitalised and toneless.

2. A flaccid condition of the uterine sac may well be put down to post-mortem relaxation, and to be in no sense an evidence of the condition which holds in the living subject.

No one who has any adequate acquaintance with the advances which have been made in the last twenty years in our knowledge of the anatomy of the pelvic and abdominal organs can fail to appreciate the enormous importance of sectional anatomy. Yet it has its limitations, and these were never better expressed than by Dr Barbour himself, who has done as much as any one in this department of research. In vol. xx. of our *Transactions*, Dr Barbour, in the course of a review of some recent papers on this subject, says:—"Great care is required in carrying over into clinical work the results gained from frozen sections. It is always a more or less cogent criticism that in them we are dealing with the dead, not the living, with anatomy rather than with physiology, with the machinery rather than with its movements" (p. 109). These remarks apply with much point to the problem under consideration. For consider the conditions under which the observation is made. The body, placed most likely on its back, is surrounded by a mass of ice and salt, and in this it lies for days,

and it may be weeks. A certain amount of the freezing mixture melts in contact with the skin. We have thus on the outside the skin, which is a porous septum, a fluid with a high endosmotic equivalent, and inside the skin a fluid like the liquor amnii, one of a low endosmotic equivalent. A comparatively rapid flow of fluid from the body must pass to the salt solution. Is it surprising that at the end of the process the sac of the uterus is flaccid and collapsed—a considerable portion of its contents has been abstracted?

An examination of Saexinger's and Winter's sections shows a flattened abdomen utterly unlike the contour of the living pregnant woman. A flaccid, partially empty uterus, with obviously only a portion of the liquor amnii remaining in it. Considerations such as these seem to me to render conclusions drawn from the dead or the frozen uterus fallacious in a very high degree.

When we come to ask if there is any direct evidence that the growing uterine wall is drawn tight over its contents, so to speak, or, in other words, that there is a positive intra-uterine pressure, we may direct attention to the fact that in the later months of pregnancy such evidence is to be found in the position and direction of the cervix, and in the bulging of the anterior uterine segment by the presenting part.

In many cases, more especially in primiparæ, the displacement of the cervex is so great that it is with difficulty reached by the examining finger, and this displacement is obviously associated with a very positive tension of the uterine sac. If the uterine sac were "flaccid," there would be no disturbance of the normal relations of the various parts. Thus the cervex would occupy its normal position in the vagina, and its normal relation to the lower pole of the uterus, and it would certainly not be tilted backward nor dragged upwards in the way it usually is in late pregnancy.

Lastly, if we may venture to compare a pathological with a physiological process, we may compare the condition as to internal pressure in an ovarian tumour with that of the pregnant uterus. In such a tumour no one can deny there is a positive pressure, for a puncture demonstrates that its contents are in a state of tension. Yet its walls grow, though not at the same rate as the secretion of the fluid. From these considerations I hold that the displacement of the viscera which occurs during the process of pregnancy can only be accomplished by a positive pressure inside the uterus,—that is, the intra-uterine abdominal pressure must be greater than the extra-uterine abdominal pressure. The amount of the difference may be exceedingly small.

Any evidence to the contrary derived from the study of the post-mortem uterus or from frozen sections is fallacious, because allowance must be made for the post-mortem loss of tone in the tissues and for the physical phenomena of fluid interchange during the process of freezing.

Dr Barbour said the Society was much indebted to Dr Milne Murray for his lucid and interesting paper. He thought that everyone would agree with Dr Murray as to the presence of a positive intra-uterine pressure. He thought, however, that the term "flaccid" was quite appropriate to the uterus. Clinical evidence corroborated the results of frozen sections as to the pregnant uterus being moulded on the spine. Dr Murray had not referred to a possible change in the tenacity of the abdominal wall at full time, as at, say, the fourth month of gestation. Intra-abdominal pressure might become less with a larger uterus, should the abdominal wall become weaker through the recti being separated. The character of the uterine wall must also be a factor. A wall that would expand easily would give a different result as to contents—pressure from one that did so with difficulty. As to the value of the data from frozen sections, he thought Dr Milne Murray minimised this. Allowance must be made for the difference between a cadaver and a living body; but the difference was not so great as one would imagine as regards topographical relations. The fallacies of the frozen sectional method were slight; while Dr Murray spoke of it as fallacious in a high degree, he would say it was fallacious in a low degree.

Dr Buist said the discussion illustrates the difficulty of realising in thought the inter-relation of the physical and physiological factors in these problems. Intra-uterine pressure and tension of the uterine wall are really interchangeable expressions of the same fact. The flaccidity of a sac removed from the body is not due to the cessation of pressure, for it is under fluid pressure without as well as within the abdomen, though not perhaps to the same extent. The flaccidity is the result of loss of tone. To speak of the tone of the uterine wall during pregnancy is to answer Dr Murray's question in the affirmative. The answer would depend on the idea they had of the relation of the growing ovum and uterine wall, *i.e.*, whether the uterine wall grows ahead of the ovum when it may be flaccid, or whether it grows because the ovum distends it. If we assume that the elasticity of the abdominal wall and of the pelvic floor remain practically constant during pregnancy, their increased protrusion shows that the intra-abdominal pressure increases. The difference of level of the fœtal head in first and subsequent pregnancies had been mentioned, but it is not merely the head but the lower uterine segment; and the change in the pelvic floor, which determines the fixation point of the uterus, may have as much to do with this as the intra-uterine or intra-abdominal pressure.

Dr J. W. Ballantyne had listened with special interest to Dr Milne Murray's scientific exposition of his theme. He agreed with him that there were fallacies in the sectional method of investigating anatomical questions, especially when these questions referred to anatomical structures in action,—*i.e.*, physiology; but he would

like it to be understood that he himself (and he believed others also) took special care to eliminate these sources of error. For instance, he did not freeze a specimen in the rough and ready way described by Dr Murray, but first wrapped it up in mackintosh sheeting, and laid it on the top of the freezing mixture for a night, then when it was hardened partially it was placed in a zinc case and embedded fully in the freezing mixture of ice and salt. In this way he thought the effects of pressure and exosmosis were largely, if not entirely, got rid of.

Dr Haultain—as neither a physicist or a frozen sectionist, and therefore an unbiassed listener—could only say that from the arguments brought forward Dr Milne Murray seemed to have thoroughly established the points claimed, and he had listened with the greatest interest and benefit to Dr Milne Murray's most able paper.

Dr Armour thought that the issue was somewhat confused by separating in thought the uterine wall from what Dr Murray, for convenience, described as the capsule. He thought it more clear to regard the growing ovum on the one hand, and, on the other, the more or less resistant capsule—this latter being defined to include uterine wall, abdominal contents, and abdominal parietes. The ovum grows and the fluid increases within the membranes. The more or less resistant structures of the capsule, defined as above, less or more give way before the growing ovum. In this way a uniform pressure is obtained within the abdomen as a whole. We may hold that while the pressure within the abdomen at the beginning of pregnancy is a certain variable amount, the pressure at the end is a certain greater amount; the difference between the two being greater or less according as the various structures of the so-called capsule are less or more resistant. Therefore one can hold that in a toneless condition of the uterine wall, as in the cadaver (or perhaps between uterine pains), there is no positive pressure within the uterus; and that while uterine muscle is in a state of tone, as during life, positive pressure must be held to exist.

Dr Haig Ferguson congratulated Dr Milne Murray on his most interesting paper. He could not quite reconcile the opposing statements of the clinicians and those who judged from frozen sections, as to the condition of the pregnant uterus. The latter described it as flaccid, whereas from clinical evidence it did not appear to be so, and certainly in Dr Ferguson's experience he had never seen such flaccidity as is described in the cases of frozen sections. Dr Barbour said that in cases of split recti the abdominal pressure would be reduced to a minimum, but that need not necessarily be the case, as recent striæ gravidarum are seen even in such cases, which prove that there must be considerable tension. The fact (as Dr Buist had just pointed out) that the whole uterine segment is forced into the pelvis in primiparæ, as

well as the fœtal head, seems to point to the firm abdominal walls being the main cause of these characteristic phenomena in primiparæ.

Dr Milne Murray replied.

MEETING V.—MARCH 10, 1897.

DR ALEX. BALLANTYNE, *President, in the Chair.*

I. The following gentlemen were elected Ordinary Fellows of the Society:—Dr Jardine, 5 Clifton Place, Glasgow, and Dr Edington, Alva.

II. *Dr N. T. Brewis* showed—(*a.*) Howard Kelly's RENAL AND URETERAL CATHETERS and BOUGIES. (*b.*) A CALCULUS which was felt lying in the pelvic portion of the left ureter, and which the patient expelled per urethram after a considerable amount of pain. (*c.*) TWO LARGE PHOSPHATIC CALCULI removed from the female bladder by vaginal cystotomy. (*d.*) A LARGE UNILOCULAR OVARIAN TUMOUR which was filled with blood, and to which was attached a large dilated tube filled with pus. (*e.*) A TUBO-OVARIAN CYST. (*f.*) A LARGE ŒDEMATOUS FIBROID POLYPUS removed per vaginam.

III. *Dr J. W. Ballantyne* exhibited a series of PHOTOGRAPHS of TERATOLOGICAL SPECIMENS which had been sent to him by Dr Michin of Charkow, Russia. They included two cases of thoracopagous double terata, one of dicephalus tribrachius, one of ectopia vesicæ and prolapsus uteri incompleta, three of anencephaly, one of micromelus, and one of amelus and intra-uterine amputation. The cases from which these specimens were taken had all occurred in the Obstetrico-Gynecological Clinic in Charkow, and would be more fully described in Dr Michin's paper.

IV. ON EXTRA-PERITONEAL INCISION IN EXTRA-UTERINE GESTATION INTACT AND AT MID-TERM.

By D. BERRY HART, M.D., F.R.C.P.E., Lecturer on Midwifery and Diseases of Women, School of the Royal Colleges (Surgeons' Hall), Edinburgh.

WHILE the conditions of an extra-uterine gestation may be very varied, there are practically four possibilities in intact forms. In the first two months the gestation is in the Fallopian tube; at the third month it begins to develop between the layers of the broad ligament and lose its pediculated characteristic; at the fourth and fifth month it is usually embedded in the pelvic connective tissue

and broad ligament, and may go on developing extra-peritoneally until full time.

These are the practical possibilities when rupture does not take place.

To-night I wish to direct your attention to the third class of cases, viz., those at mid-term, intact and extra-peritoneal, and to consider specially the method of operation to be selected. I have now operated on five such cases. All were intact except one; three had a well-developed fœtus and placenta; in one, only the placenta was present, and in one, extravasated blood alone was found, although the case had all the characteristic symptoms and signs of an extra-peritoneal four months' gestation-sac. I shall first briefly relate the cases, state some points as to diagnosis, and, lastly, discuss the question of the best operative route.

The first case was a very evident broad ligament gestation, but unfortunately it had ruptured prior to operation, and the patient died. I have already published drawings of the frozen sections I then made, and show to-night models of these and some of the different varieties of such a gestation.

The second case was operated on at mid-term. I made a mesial abdominal incision, opening the peritoneal cavity and also hitting the extra-peritoneal wall of the sac above the pubes. I removed part of the placenta then, plugging the sac with iodoform gauze. A week after, I removed the rest of the placenta and a well-developed four months' fœtus, as I had purposely left the wound in the abdominal parietes large enough to admit my four fingers. This patient recovered well, and remains so. The sac was shaped like an hour-glass, and the fœtus lay in the lower division.

In my third case there was an extra-peritoneal mesial sac with its fundus at the level of the brim and the empty uterus on the top of this. There was four months' amenorrhœa, but on abdominal section I found the broad ligament distended with blood-clot only. Microscopical examination was negative as far as the existence of villi or decidual cells was concerned. I plugged the sac with gauze and then drained, stitching the sac opening, of course, to the abdominal wound. The patient made an uninterrupted recovery.

My fourth case had missed four periods, had a sac on the right side attached to the pelvic wall; the uterus was distinct and somewhat enlarged, and the gestation was developing into the iliac fossa. In this case I operated as follows:—

I first made the usual mesial abdominal incision. On passing my finger into the abdominal cavity I found the peritoneal reflexion normal on the left side, while on the right half of the anterior abdominal wall it ran obliquely up and out, considerably to the inside of the usual incision for ligature of the external iliac. By making an oblique incision in the right flank I was therefore enabled to get at the sac on its extra-peritoneal aspect, and

pushing my finger through, to extract a fœtus apparently normally developed for the number of periods passed. There was a little blood lost at this stage, evidently from some separation of the placenta, but I plugged the sac with iodoform gauze, leaving the wound unstitched and quite large enough to admit my four fingers afterwards. On the fourth day a well-formed decidua was expelled from the uterus, and on the same day I removed the tampon from the sac, but as bleeding set in, I plugged again. On the seventh and tenth days I removed the plug and separated placenta on these two occasions. After this the sac was simply stuffed with gauze, and slowly cicatrised in six weeks. The sac dipped down inside the true pelvis and between the laminæ of the right broad ligament, and the placenta lay apparently to the outer and lower sides.

On the seventh and tenth days the placenta could be easily differentiated from the tissues, but not on the fourth day. The cast I show, taken when the wounds had healed, gives the relation of the incisions. The mesial abdominal one healed perfectly.

My fifth and last case was a unique and protracted one. When I saw her there was a history of an incomplete abortion lasting for about four months. On examination I found, however, a tumour involving the right broad ligament, blended with the uterus, and reaching to the level of the brim of the pelvis. One could thus only suspect extra-uterine gestation. There were no inflammatory symptoms. I advised that the case be kept under observation, and was informed in a few days that the swelling had passed into the right iliac region, that the pulse and temperature were high, and that the patient had also had several rigors. I incised in the right flank, expecting pus, but got into a shallow cavity with putrid blood. Dr Shennan was unable, however, to cultivate any organisms from it. There was no communication with the deeper mass in the pelvis. I plugged with iodoform gauze. Next day the patient began to show signs of right-sided parotitis, which in a few days suppurated. Mr Caird incised and drained this. In a week I removed the tampon from the iliac cavity and replugged. In another week I removed the plug from the iliac cavity, and, pushing Keith's forceps into the pelvic mass which dipped down to the rectum, entered a cavity, and could feel what appeared to be placenta, but no fœtus. After washing out with weak carbolic lotion, I tamponned with gauze. In an hour the patient was unconscious, with high pulse, and apparently dying. I thought the cause of all this might be cerebral, but next day the carboluria cleared up my ideas as to diagnosis, and the patient quickly pulled round. The last freak, if I may say so, on the part of this patient was to develop a fæcal fistula, the sac evidently opening into the rectum. This, however, spontaneously closed, and she made an excellent recovery. This patient had a good physique, a nervous system like iron, and was happy and

contented all the time of her illness. I did not share her equanimity, but ultimately came to respect her recuperative powers.

In my comments I shall restrict myself to the question of *diagnosis* and *treatment.*

As to *diagnosis,* that of extra-peritoneal gestation intact and at the mid-term is fairly easy, if seen then, and for the first time. There is a history of amenorrhœa or irregular menstruation, of attacks of severe pain and occasional fainting, associated with a tumour at the level of the brim, usually lateral and moored to the side. The uterus, somewhat enlarged, may be mapped out separately. The diagnosis is more puzzling if the case be under observation all the time, but the increasing swelling will make one suspicious, and when about the third or fourth month the tumour appears at the level of the brim, and is found bound to one side, doubt changes to certainty. The expulsion of a decidua is often a help when entire, but if expelled in shreds the medical man may be misled, especially if he omits bimanual examination of the pelvis, into considering it a mere abortion. I attach great importance to lateral fixation.

I have not been able to find any criterion by which one can say that a fœtus and placenta are present and not merely blood-clot. In only one of my cases did I hear the placental souffle.

Now, as to *treatment,* I have first to urge that nothing be done that is not operative and radical. Most of us, I daresay, hold the same opinion now.

But before operating one must settle some pathological points so as to make the treatment rational. My pathological faith in this class of case is simple. I believe that the gestation is extra-peritoneal; that the possibility of its being an ovarian pregnancy is most remote, and that primary intra-peritoneal gestation is a myth. This clears the ground, but I would further simplify it by saying that for operative purposes I look on the case as one where there is a fœtus and placenta in the extra-peritoneal tissue, and that these and these alone require to be removed.

I advocate, therefore, extra-peritoneal incision where possible, immediate removal of the fœtus, tamponnade of the sac till the placenta is thrombosed; it can then be separated easily, and the bleeding of premature separation thus avoided. The following points must, however, be noted:—I think it best to open the abdomen in the middle line first. One finds out more exactly the relations, and if the peritoneal reflexion be lifted high in front, may cut in extra-peritoneally and mesially. If, however, the lateral elevation of peritoneum is present, one can determine precisely where to cut, and thus hit the extra-peritoneal aspect of the sac exactly. The special advantage of the extra-peritoneal abdominal incision is the avoidance of peritoneal infection, the ease of the tamponnade, the fact that one plugs against deep resistant

structures, and, above all, the convenience in after-treatment of plugging and removing the sac contents from above. The patient is less disturbed, and all application of pressure, and watching the patient for bleeding, immensely simplified. I leave the extra-peritoneal wound large enough to admit four fingers. It will be found to cicatrise firmly.

It may be urged, however, that one may operate by the vaginal route in these cases, and this method is undoubtedly coming into favour. I have not adopted it, however, for the following reasons. Of course I quite admit that a vaginal incision into an extra-peritoneal sac containing only blood, followed by washing out, is excellent treatment, but my difficulty is that if a fœtus and placenta be present, as they may be in an apparent hæmatocele of four months' standing, the arrest of the hæmorrhage is very difficult, the tampon infinitely less effective and more dangerous, and the after-treatment much more troublesome. On all these grounds I therefore advocate strongly the treatment I have recommended as safe and sure.

I have to thank Drs Webster, Fordyce, and Chipman for their skilful help at the time of operation.[1]

Dr N. T. Brewis agreed with Dr Hart that the extra-peritoneal incision was the correct one for extra-peritoneal cases, and that the peritoneal cavity should be opened in the first instance to find out whether the sac was extra-peritoneal or not. Dr Hart had been fortunate in his cases, in that they were all extra-peritoneal, because all cases at mid-term are not so. Dr Brewis had met with three cases where the sac was intra-peritoneal, and in one of these incision of the sac was followed by bleeding so profuse that it could not be stopped until the ovarian and uterine arteries had been tied and the uterus removed. He considered, however, that for the class of cases cited by Dr Hart the lines of treatment advocated were correct.

Dr J. W. Ballantyne had listened with great interest to Dr Berry Hart's novel plan of dealing with ectopic gestations. He was struck by the fact that of late there had been a distinct movement in favour of the extra-peritoneal operation in more than one kind of case. For instance, Krajewski in a recent number of *Przeglad Chirurgiczny* strongly advocated this plan of treatment in cases of rupture of the uterus without laceration of the peritoneal membrane; the cavity containing the blood could thus be easily reached and freely drained. The incision used was that of Bardenheuer. Dr Berry Hart's suggestion as to extra-uterine pregnancy was, he believed, made now for the first time.

Dr Berry Hart thanked the Fellows for their kind reception of

[1] My first case was examined in 1887; I operated on the second case, using the iodoform tampon on, March 30th, 1893. The fourth case was operated on in August 1896, by extra-peritoneal incision, and the fifth in October 1896.

his paper. Dr Milne Murray had asked why he did abdominal section as well as make the extra-peritoneal incision? The reason was to make absolutely certain of the relations, and that no fresh change had arisen since the last examination. A difficulty might arise where the fœtus had become intra-peritoneal and the placenta, of course, still extra-peritoneal. In such cases the operator might try to get down on the placenta by a lateral incision, stuff with gauze, and remove the placenta subsequently.

V. ON THE ACTION OF THE MIDWIFERY FORCEPS.

By C. F. PONDER, M.B., C.M. (Edin.), Charteris Hospital, Kalimpong, Bengal, India.

(Communicated by Dr J. W. Ballantyne.)

RECENTLY my attention was directed to the study of the mechanism and action of the instrument known as midwifery forceps; and I now beg leave to present to our Society the results, in the hope that the conclusions I have arrived at, if correct, may be helpful to you and to others.

I would preface my remarks by explaining that what is advanced in this paper is meant to have reference only to those cases where, except the delay, everything is normal, and which probably form more than four out of every five cases in which the accoucheur has anxiety as to the results. I do not now mean to discuss the relation of instruments to deformed pelves, fœtal hydrocephalus, or other abnormal cases which, although raising the gravest questions when they do happen, are fortunately of comparatively rare occurrence.

In normal parturition the chief factors we have to deal with are:—

I. Uterine contractions, which, acting to a large extent through the fœtal body and head, dilate the passages, and so open up the way for the expulsion of the child.

II. The maternal passages, the tissues of which, previous to their dilatation, resist the onward progress of the fœtus; but after a time lose their tone, and relax, so allowing the child to pass on.

The only measure we have of the amount of uterine action is its ability to overcome the resistance of the passages, and the only measure we have of the rigidity of the passages is their ability to retard the descent of the fœtal head.

Excluding for the present those cases where uterine action is altogether absent, or nearly so, and also those cases where there is organic rigidity of the passages resulting from cicatrices, malignant disease, etc., I think it is not the best way of regarding cases of prolonged labour to think of them as being divisible into two groups, the fault in each being absolute, and not relative to the comparative strength or weakness of the other—of one group as

being due to faults in the powers, and the other group due to faults in the passages. It would be more correct to say, that the expulsive action is insufficient to overcome the resistance of the passages, or what amounts to the same thing, that the resistance of the passages is too much for the maternal expulsive powers.

What is nature's remedy in such cases? The risk of the damage to the vital parts of the child is a sufficient reason for her limiting the amount of the uterine contractions, so that there is no undue pressure on the fœtal head and neck. But the soft tissues of the maternal passages are, without serious injury, capable of dilating to a much greater extent than will suffice for the expulsion of a normal fœtus. Thus we find that the physiological remedy for labours of this kind is (not increased uterine action, but) relaxation of the maternal tissues. And in this, as in all else, our wisdom is to copy nature; therefore I submit that the correct treatment of such cases is (not to try, by oxytocics, abdominal massage, and such like, to increase the uterine contractions, but) to dilate the maternal passages.

The present teaching concerning the action of midwifery forceps is practically the same in all the authorities which I have now access to, and may be summed up thus—that it acts in the following ways:—

I. By traction on the fœtal head,—this is by far its most important action.

II. By direct compression of the fœtal head, so as to decrease its diameters.

There are also other three actions stated, viz.:—

III. Lever actions.

IV. Changing the position of the fœtus.

V. Action as a foreign body in the uterus.

These last three actions are said to be comparatively unimportant, and therefore at this stage may be passed over.

To show that this is fairly stating the teaching, I may quote from Playfair's *Science and Practice of Midwifery*, seventh edition, vol. ii. p. 183:—

"The forceps may be best described as a pair of artificial hands, by which the fœtal head may be grasped and drawn through the maternal passages by a *vis à fronte* when the *vis à tergo* is deficient. This description will impress on the mind the important action of the instrument as a tractor, to which all its other powers are subservient."

And again on page 190 it says, "the forceps is generally said to act in three different ways—

I. As a Tractor.
II. „ „ Lever.
III. „ „ Compressor.

It is more especially as a tractor that the instrument is of value." Now I think that this is inaccurate and misleading. It does

not convey to the mind a correct conception of the action of the present midwifery forceps, in that it omits reference to what I venture to say is by far the most important use of this instrument, and exaggerates actions which, if they exist at all, do so only to a trifling extent, and which, in proportion as they are present, are only injurious. The present teaching concerning this instrument seems to me to be in its essential features the opposite of what should be. And the only reason that disaster does not more frequently follow its use, is that the instrument is better than it is described.

First, let me give you my conception of the action of this instrument. While it is true that, with the present form of forceps, there may be a small amount of traction and of compression of the fœtal head, yet by far the greatest portion of the force exerted goes to dilate the maternal passages. A small amount goes to overcome the friction of the blades of the instrument as they pass outward. But as the vaginal walls are amply lubricated with mucous secretion, this friction is so slight that it may be disregarded. If any one will introduce the blades of the forceps into the passages of a dummy mother, place them in position, and then apply traction in the ordinary way to the empty blades, he will find that a considerable force is required to pull them out. And he will at once recognise that this force is exerted, neither in traction nor in compression, but altogether in overcoming friction and in dilating the passages. Now let him introduce the dummy fœtus, and place the forceps in position on the head. Then let him apply traction, and he will find that only a slightly greater force is required to draw out the forceps with the dummy fœtus in position, than is required to draw out the empty forceps blades. This additional force represents what is expended in traction and compression of the dummy head. But in the living mother this additional force is still further diminished, (1) by the mucous secretion of the passages abolishing the friction, and (2) by the maternal expulsive powers, primary and secondary, which push forward the fœtus as the way is opened up for it.

So that I venture to submit, (1) that by far the most important action of the midwifery forceps as at present used, is to dilate the maternal passages—so opening a way for the escape of the child; and that (2) in ordinary cases traction on the fœtal head hardly exists, but as the passages are opened up by the forceps the *vis à tergo* (*i.e.*, the maternal expulsive powers) push the child forward, keeping its head close up behind the advancing forceps, and so giving an appearance of what probably in most cases does not take place at all, that the forceps is pulling out the fœtal head.

This *vis à tergo* (or maternal expulsive force) is probably much more powerful in its action than is thought. Usually it seems to be inoperative and slight, but this is only because of the tenacity of

the resisting tissues. Whenever the head succeeds in stretching the vulva sufficiently for its passage, it is expelled with a vigour almost resembling the way a pellet is shot out from the barrel of an air-gun.

The only cases where traction of the fœtal head exists to any extent are those where (from any cause, *e.g.*, a relatively large fœtal body, or unusual elasticity of the tissues of the maternal passages) the body of the child is held back. Under such circumstances traction can only mean a strain put on the neck, and it will be evident that this adds immensely to the risk of injuring the child. Indeed, it seems to me that where the body is held back is just the class of case where the accoucheur, as he values life, ought to abstain from any traction whatever.

I will now discuss the teaching at present given of the action of midwifery forceps. As I have said it is that this instrument acts by—(1), traction on the fœtal head; (2), compression of the skull, and in some other less important ways.

(*a.*) *Traction on the Fœtal Head.*—The idea of traction or pulling implies that there is something to be pulled against, some resistance to be overcome. In this case there can be only three possible causes of resistance:—

(1.) The friction of the forceps blades and fœtal head as they descend along the maternal passages. As I have explained, this is so slight that it may be altogether disregarded.

(2.) A dilating action of the passages by those parts of the head which project beyond the forceps blades. This, however, is only slight, and is overcome by the gentlest forward movement of the instrument.

(3.) The only serious resistance requiring to be overcome by traction is, as I have already explained, that offered by the body of the fœtus when for some reason its descent is retarded. The shoulder girdle is the part most likely to be caught. And I leave you to imagine the result of applying traction to the head when the shoulder girdle is held back.

It is altogether misleading to talk of the fœtal head being grasped by the forceps, and drawn through the maternal passages, when the *vis à tergo* is insufficient. The uterine force is ample to expel the child if the passages are sufficiently dilated. In nine out of every ten cases of difficult and prolonged labour it is not the uterine contraction that is at fault, but the passages do not dilate with sufficient rapidity. Except in the case of a child already dead, I submit that traction on the fœtal head is always and altogether wrong—that the very opposite of this ought to be the teaching of our schools, viz.,—that in all cases where there is a hope of delivering a living child, there should be no traction on the fœtal head whatever, the only traction allowable being on the body after the shoulders have passed beyond the maternal pubic arch, and then only traction on the shoulder girdle, say with the fingers of the accoucheur in the axillæ of the child.

(*b.*) *Compression of the Fœtal Head.*—No doubt in normal parturition the fœtal head is compressed somewhat; but this compression is mostly on its vertex. The result of this is to shape the head somewhat like a wedge, so enabling it the more affectually to push aside the obstructing tissues. While the tissues themselves, after a time, lose their tone and relax. In this way the passages dilate for the exit of the child. The uterine contractions which thus compress it are carefully regulated by nature so that the child's head is uninjured. Very different from this is the force exerted by a strong masculine hand, acting through a lever, and compressing the fœtal skull. Besides, the pressure exerted by nature on the head is, as I have said, almost entirely expended on its flexible part, *i.e.*, the vertex; while it seems to me, that if forceps exerts any compressive force at all, it is on the base of the skull, which, being more rigid, is more liable to fracture. So that instead of being comparatively harmless, as is the compression exerted by nature, that exerted by forceps is very likely to injure the child.

In this connexion some teachers go so far as to say that, in using Simpson's axis-traction forceps, "the screw should be relaxed between the pains so as to relieve the compression of the head, as too long compression is dangerous." I think that a more careful study of this instrument would have shown that such an action is quite needless. *Firstly*, the instrument when in action is rigid, and as Playfair has shown, has no lever action at all. *Secondly*, the forceps is so constructed that the maximum distance between the blades is the same as the bi-parietal diameter of the fœtal head. So that, normally, when the head is lying in position between the forceps blades, compression is impossible. The cases where compression does occur are those where the head or body is held back, and the forceps is pulled forward. Then the bi-parietal diameter gets into the narrower portion of the forceps blades, nearer the points. And when this occurs, the more traction there is, the more will be the compression of the base of the fœtal skull. Immediately, however, the traction ceases the forceps slips backward somewhat—the bi-parietal diameter resumes its position of lying in the greatest diameter of the forceps blades, and by so doing compression ceases. So that releasing the screw of the forceps is superfluous.

If the present teaching of the action of forceps is correct, this instrument should be classed with the cranioclast and the basilyst in the group of those whose purpose is to save the life of the mother by injuring the fœtus, and differing from the others only that, in most cases, relief is obtained before its action has gone so far as to altogether destroy the child.

But the midwifery forceps is not what it is thus represented to be. Every one belonging to this Society is well aware that in practice it has saved innumerable lives, and has done untold good

in shortening the agony of parturition. But I repeat what I started with, that our conception of its action has been wrong.

Even more unfortunate than this misconception regarding the action of this instrument is the name by which it is known. The name forceps is misleading, as it conveys to the mind the idea of an instrument meant to grasp, or seize firmly, and pull out the child by force, an action similar to that of dental or other forceps. Perhaps the best definition of forceps I can at present lay my hands on is that given in *Chambers' Encyclopædia*, which says that forceps consist "of two levers of metal jointed together crosswise, nearer to one end than the other. The hand grasping the longer ends of the levers or handles closes the shorter ends, which are shaped so as to seize firmly the intended object." Although it is true that, when in pieces, the instrument may somewhat resemble this description, yet when in use it has nothing whatever of the action of forceps.

Playfair's *Midwifery*, vol. ii., on page 191, says, "As ordinarily used, the handles are held with a sufficiently firm grasp to prevent this movement (*i.e.*, lever action), and then the two blades practically form a single instrument." More especially is this the case in axis-traction forceps. When the blades are in position and locked they form a rigid instrument. With the exception of the traction rods, which of course are not now referred to, the parts of the instrument when in use have no motion on each other at all, and there is absolutely no lever action whatever. So that this instrument is in no sense a forceps. The word traction, in the name axis-traction forceps, is misleading if it conveys to the mind the idea of traction on the fœtal head. The only traction permissible is that on the instrument blades; the force expended in traction resolving itself into two parts: one, the larger, operating in dilating the passages and acting at right angles to the line of exit; the other, the smaller, expended in overcoming the friction of the passage walls. But this last, as I have already shown, is so trifling that it may be neglected. So we may say that practically the whole of the force of traction goes to dilate the passages. Of course, understanding it in this sense there is no objection to the term.

As a rule it does not matter by what name a thing is called. But in this case it matters very considerably; and this because the name conveys such definite ideas. I am sure none will disagree with me when I say that the conception the average practitioner has of midwifery forceps is that it is an instrument meant to grasp the fœtal head and pull it out of the maternal passages, and with this idea of the action it is only to be expected that the application of forceps should be generally considered as a dangerous operation, fraught with great risk to both mother and child. And so the instrument is regarded with suspicion, only to be used when all else fails. The public, too, if they know any-

thing at all of these matters, when they hear of forceps, instinctively associate it with something dreadful, dangerous, and usually ending in disaster. Very probably the explanation of friends so often refusing to sanction operative treatment until every other device possible has failed is the erroneous impression they acquire from the name of this instrument. I had at first thought of placing the ideas of this paper before you in the form of suggestions of a change in our conception of the action of forceps and an alteration of its name. If any one prefer to adopt this view of what is now advanced I have no objection. But to do this would, it seems to me, not sufficiently emphasize the radical nature of the changes I propose. I think I will best serve the other members of my profession, and the public, whom it is our privilege to benefit, by presenting my views to you as an altogether new conception (so far as I know) of operative interference in obstetrics, and the instrument I propose as an entirely new one.

Let me give you what I think the function of an ideal instrument for such cases should be. It should act in three ways:—1. Dilating the maternal passages, so making a way for the descending fœtal head; 2, protecting the head from injury or undue compression during delivery; and 3, guiding it on its outward journey.

With regard to the first—*i.e., dilating the maternal passages,*—my conception of this instrument is that it should act exactly in the same way as a snow-plough. A railway line (say) is blocked with snow, the locomotives are unable to propel the trains, and things are at a standstill. Then the snow-plough is brought into requisition. It goes forward, pushing the snow to either side, and so opens up a way for the trains to pass. Exactly so this instrument: it pushes aside the obstructing tissues, and so opens up a way for the descending head. It is no more the function of this instrument to pull out the head, than it is the function of the snow-plough to pull the train forward. If the passages are dilated sufficiently the uterine force is sufficient to expel the child. Therefore any traction on the fœtal head is unnecessary, and, as I have already shown, is only productive of harm.

As regards the second action, *i.e., protection of the head.* To understand this action I need only ask you to put a ball of pliant material, *e.g.*, glazier's putty, the size of a normal fœtal head, between the blades of the forceps, and draw this through the passages of a dummy mother. You will readily understand how nearly all the force exerted is expended in dilating the passages, and that the ball is both carried forward and also to a considerable extent saved from compression or injury by the forceps blades. The instrument should really form a rigid case, which protects the head from injury. With the ideal instrument there would be neither traction nor compression any more than a

locomotive applies traction directly to the passengers in a train. It applies traction on the carriage, and the passengers, comfortably seated inside, are moved forward as the carriage moves.

As to the third action, viz., *guiding the head on its outward journey*. This includes all the slight actions which occasionally, but only to a very small extent, are helpful. These have received such names as lever action, etc. But all such names give an exaggerated idea of what is meant. The action itself is of the gentlest possible character, and I prefer to use a word which conveys this idea.

With regard to the form of the instrument, as I am now far away from opportunities of experiment or investigation, I do not feel in a position to say anything very definite. Having given you my ideas of the functions of the instrument, I may leave it to those who have the mechanical skill and opportunities to work out how best those ideas are to be realized. I will only indicate the principal directions in which I think modifications may be made, taking Simpson's axis-traction forceps as my type.

The chief alterations in the shape of the instrument which I would suggest are, that the blades themselves be widened and their ends blunted, also that the distal ends of the blades be made wider apart, so as from their maximum diameter to the end farthest from the handles to present a nearly cylindrical shape. The maximum external circumference of the instrument would thus more closely accord with what the maternal passages normally dilate to as the head passes through. Thus would a way be opened up for fœtal head, while the absence of narrowing of the cavity towards the points of the instrument would tend to prevent injury to the neck and base of the fœtal skull.

There are several other modifications I might suggest, *e.g.*, doing away with the crossing of the handles, and so with the lock, both of which seem to me to be needless complications. The object aimed at could be attained by a simpler mechanism. However, as these points are only of minor importance, I will not obscure the main purpose of this paper by referring to them further.

As to the name, I would suggest that it be called "Dilating Vector" or, briefly, "Vector." If any one cares to retain the name of axis-traction, then "Axis-Traction Vector" would do very well. The name vector is as short and as convenient as is the word forceps. It gives the idea of a carrier or bearer which carries the head forward in its birth, protecting it from compression or injury. While the word dilating will convey to the mind its true function of dilating the maternal passages.

The statistics given regarding the results of using forceps seem to me to be unfortunate and misleading; for instance, those mentioned on page 17, vol. ii., of Playfair's *Midwifery*. After giving reasons for the more frequent use of forceps, it says, "Against

this conclusion statistics may possibly be quoted, such as those of Churchill, who estimated that one in twenty mothers delivered by forceps in British practice were lost." Playfair is right in characterising such statistics as fallacious, and in saying that these "results are due not to the treatment, but rather to the fact that treatment was so long delayed." This is true; but also I venture to say that it is only misleading to group together every kind of case in which forceps is used, and to show the resulting average mortality as giving the risk of using forceps. As well might a surgeon group together all the cases in which he used the knife (major and minor operations, malignant tumours, amputations, opening of abscesses, etc.), and give the resulting average as the risk of using the knife. If we could conceive anyone at all deserving of the name of surgeon to be so unscientific, the result of such statistics on his practice could only be to lead him to regard the knife as a dangerous instrument, to be used only when everything else failed, and when all hope of nature's effecting a cure has disappeared. And this conception of the place of the knife could only have the effect of making him delay its use as long as possible, and as he delayed, so would the percentage of his disasters increase.

The gain which I venture to hope will result from this altered conception of instrumental aid will be immense.

(1.) *On the friends of the patient.*—They will realize that this instrument differs essentially from many others in that it is not destructive, but altogether conservative of life—that its application will both shorten the agony of the mother and also increase the chances of a successful issue for both mother and child—and that thus its use can be only beneficial. As soon as the public grasp this idea of operative interference, there will, I am sure, be much more readiness on the part of the friends to give consent to the accoucheur giving instrumental aid in cases of difficult or prolonged labour.

(2.) *On the accoucheur.*—His mind will instinctively associate this instrument with dilatation of the maternal passages, and not, as in the case of forceps, with either traction or compression of the fœtal head. He will know that its action is entirely physiological, that he is acting in strict accordance with nature, and that what he is doing in no way adds to the risk of either mother or child, but, on the contrary, that it not only diminishes the suffering of the mother, but very considerably reduces the risk of death or injury to either. With an instrument having this action, all hesitation on the part of the practitioner will disappear. On the first sign of danger or delay the instrument will be used, and this with the result of reducing the total disasters which occur in childbirth. With this new conception of its action, and an ideal instrument, the obstetrician will no more hesitate to give assistance than a surgeon would hesitate to apply a splint to a fractured

limb, and, in the event of disaster following, no more think of blaming the instrument than he would think of blaming the aseptic knife if death followed the opening of an abscess.

The practical result of this will be a very marked shortening in the length of time which labours are allowed to go on before instrumental aid is given. And I need not enlarge to you upon the immense gain to life and health of both mother and child of a shortened second stage of labour.

The worst accident that is likely to happen from the more frequent use of instrument in the manner here advocated is laceration of the perineum. But this is almost invariably a trifling and easily remedied injury. Of course the careful obstetrician will, by gentleness and care, endeavour to avoid this accident. But when the alternative is between a torn perineum and a dead child, who will for a moment hesitate?

The conclusions I would beg to submit for your consideration are—

1. That traction or compression of the fœtal head as performed by any instrument is unscientific and fraught with very great danger, and that neither of these actions should ever be made use of, except in those cases where the child is already dead.

2. That the present teaching regarding the action of midwifery forceps is faulty in that it ignores the chief action of this instrument (which is that of vaginal dilator), and exaggerates actions (viz., traction and compression of the fœtal head) which, if they exist at all, are only of minor importance. And that the name forceps is a most unfortunate one, in that it gives an altogether false idea of the action of the instrument, and so tends to bring discredit on operative interference in cases of prolonged labour.

3. That the ideal instrument for such cases should have the following functions:—(1.) Dilating the maternal passages. (2.) Protecting the fœtal head from compression or injury in its descent through the maternal passages. (3.) Guiding it on its outward journey.

4. That this instrument should receive a name which would convey an idea of its true function; and for this I would beg leave to suggest "Dilating Vector," or, briefly, "Vector."

Dr Berry Hart said that the usual view one took of the forceps action was that it seized the head, drew it down, and thus made the head dilate the passages—Dr Ponder's proposal thus seemed unnecessary.

Dr J. W. Ballantyne thought that there were several points in Dr Ponder's paper that were worthy of attention. It was to be remembered that Dr Ponder expressly excluded cases of pelvic deformity and disproportion in the size of the fœtus, and limited his thesis to the cases where, on account of delay and its dangers,

the use of the forceps was indicated. He thought the idea of the forceps as a vaginal and vulvar dilator was a correct one, albeit little or not at all mentioned in the text-books; and he also was impressed by the danger which Dr Ponder emphasized of the fœtal head slipping into the narrow part of the forceps and so becoming compressed. In a paper by Dr Coromilas which he (Dr Ballantyne) had communicated some time ago to the Society, the same idea of vaginal and vulvar dilatation as an aid in labour was dwelt upon, but Dr Coromilas used his hand and an anæsthetic and antiseptic ointment instead of forceps for the purpose.

VI. ELECTRO-NEGATIVE PUNCTURE IN THE TREATMENT OF UTERINE FIBROMYOMATA: A RECORD OF THREE CASES.

By F. W. N. Haultain, M.D., F.R.C.P.Ed., Lecturer on Midwifery and Gynecology, School of Medicine; Physician for Diseases of Women, Deaconess Hospital, Edinburgh.

More than two years ago I gave an account of my experience in the electrical treatment of uterine fibromyomata, with perhaps an enthusiasm as to the benefits to be derived from its adoption, which, from the somewhat limited number of cases cited, might be questionable. Since that time to this I have continued to follow this method of treatment in similar cases, with results so encouraging that any enthusiasm then shown in its favour is if possible more pronounced.

It is not my intention to dilate further on the general hæmostatic and curative properties of the treatment, beyond mentioning that in these respects it has since amply fulfilled the sanguine expectations I then formed of its value, but it is my desire to place before you a record of three cases, treated by electro-negative puncture, which are perhaps of more than usual interest. They represent, I may add, my entire experience in this method of electrical treatment.

Case 1.—Mrs H., æt. 36, had suffered for many years from a large uterine fibroid, which had from the attendant hæmorrhage so reduced her health, that Dr Croom decided to remove her appendages. This he accordingly did on 29th Oct. 1893.

The operation unfortunately had no beneficial effect, either in arresting the hæmorrhage or the growth of the tumour, and her condition went from bad to worse. From the extension downwards of the tumour into the pelvis, pressure symptoms of a most exaggerated degree were developed. These consisted in complete urinary incontinence after previous retention, agonising pains in

the back, cramps of the lower extremities, and albuminuria, probably the result of pressure on the ureters. At the same time profuse uterine hæmorrhage rendered her exsanguine to a marked degree. Except under morphia she had for months never been free from pain, and quoting from her own words, "she frequently prayed for death to relieve her sufferings." During this period injections of ergotin and other forms of medicinal treatment had been assiduously carried out.

By Dr Croom's request I was consulted by her on 7th Dec. 1894, as before undergoing hysterectomy, which had been recommended, she wished to know if electricity could be of any benefit. Though apparently hopeless, I determined to at least give her a trial of the electric treatment. In this determination I was supported by Dr Milne Murray, who saw the patient, and of whose opinion I gladly availed myself. The local condition, on examination, showed the true pelvis to be filled with a tumour, which encroached on the vagina to such an extent, that it was impossible to reach the cervix, which was high above the symphysis pubis. The upper border of the growth reached to three fingers' breadths above the umbilicus (Fig. 1).

On 14th Dec. I commenced the electrical treatment, and adopted electro-negative puncture through the posterior vaginal wall as the only method available. At this sitting I was enabled to pass a current of 150 milliamperes without great discomfort. The treatment was repeated on the 21st; and on the 23rd the patient informed me that since the last application she had been entirely free of pain, an experience she had not had for months, and further, that she could retain her urine while in the recumbent position. The applications were continued at weekly intervals, and after the seventh application, on the 26th of January, she had absolute control over her bladder in any position. Applications were continued twice weekly till twenty had been given, and as the hæmorrhage had now considerably abated, and the pain absolutely ceased, treatment was discontinued on the 19th March. Unfortunately, late in July, feeling particularly well, she resumed her corsets and went for a long walk, with the result that the old pressure pains and urinary symptoms returned, associated with severe vomiting and an increase in the albuminuria. The electrical treatment was again continued with the same satisfactory result as regards symptoms, and after the tenth application I was astonished to find that the tumour had entirely passed into the abdominal cavity, and the cervix could be reached with ease. Intra-uterine positive electricity was now commenced, and a further ten applications given, treatment being altogether suspended on the 10th Oct. 1895. Since that time she has been in absolute health; menstruation regular, lasting about five days; and, on examination, the tumour can now be felt freely movable in the abdomen, and springing from the

fundus uteri; its upper border reaches about two fingers' breadths above the umbilicus.

It would thus appear that the tumour was essentially of the subperitoneal type, and had become accidentally incarcerated in the pelvis, where it had continued to grow, but, after having become diminished in bulk, it had returned to the abdominal cavity.

CASE 2.—Miss S., æt. 38, consulted me in February 1893, on account of a large fibroid tumour, which for a week previously had caused complete retention of urine, and necessitated the regular use of the catheter. For some weeks before this time she had suffered from occasional transient attacks of urinary retention, which occurred about her menstrual periods. She had already consulted an eminent specialist, who stated that nothing short of complete removal of the growth would benefit her; but, having heard from a friend about the electrical treatment of tumours, she decided to try if by this means anything could be done for her, before, as she graphically put it, she allowed herself to be "cut up."

Beyond the urinary retention and its associated discomfort, she did not complain of any other well-marked pressure symptoms. She was stout and plethoric in appearance, and further than suffering from a dull and almost constant headache, and a feeling of weight and fulness from the presence of the tumour, she felt strong and well. She menstruated regularly, but scantily, for about two days. On examination, a large solid swelling could be felt in the abdomen, reaching to two fingers' breadths above the umbilicus, continuous with a large solid mass in the pelvis, which so obstructed vaginal examination that the cervix could not be reached (see Diagram, Case 2). Energetic attempts to push the pelvic portion of the tumour above the pelvic brim proved absolutely futile, though made with the patient anæsthetised, and placed in the prone and genu-pectoral positions.

Treatment by electro-negative puncture was commenced on 24th March, a strength of current of 180 milliamperes being used, with the astonishing result that spontaneous micturition could be accomplished the same afternoon, and from that day till this a catheter has never been again required. The first menstrual period was extremely profuse, and lasted ten days. Subsequently, fifteen electro-punctures were made within the next ten weeks, and by the middle of May the growth had so materially lessened in size that I could with difficulty reach the cervix, and was able to introduce the electrode into the uterus. The cavity measured $4\frac{3}{4}$ in. I then continued the treatment by giving a further fifteen applications with one electrode in this situation. I, however, maintained the intra-uterine pole negative, as, from the increased

menstrual periods, her headaches had ceased, and I feared that the positive pole might here cause a diminution in the amount, which would be injurious.

After the completion of the treatment the patient returned to her home in London, and I did not see her again till six weeks ago. On examination then I found the tumour still pelvic, situated on the posterior uterine wall, and about the size of a small cocoanut, the uterus and tumour being freely movable together. The cervix was easily reached, and the sound passed into the uterine cavity about $3\frac{1}{2}$ in., $1\frac{1}{4}$ in. less than when first measured.

The patient described herself as being in perfect health, her menstruation perfectly regular, but much increased in amount. The tumour in this instance was evidently intra-ligamentary, as, though freed from incarceration, it still retained its position in the pelvis.

CASE 3.—Mrs B., æt. 46, was recommended to me by Dr Macdonald Robertson in May last. She suffered from complete urinary retention, which had lasted for three days. She had had previous transient attacks of a similar nature. Menstruation regular and normal.

On examination, a large tumour was found impacted in the pelvic brim, tilting the uterus high above the symphysis pubis. Attempts at reposition into the abdomen were futile. Electro-negative puncture was adopted, with the effect that the same afternoon she was able, with difficulty, spontaneously to void urine. Retention, however, recurred the following day, and persisted till the next application of the battery, when again the urine could be temporarily voluntarily passed. After the third application retention did not recur; after this, two applications were made, but the patient, being extremely nervous, refused further treatment. Since that time I have not again seen her, but hear from Dr Robertson that he has not again been troubled to pass the catheter, and she says she feels quite well.

The cases just stated represent my entire personal experience in electro-puncture treatment, and, I trust, justify the length and fulness with which I have related them.

The method of treatment I have adopted has been as follows:—

Preliminaries.—The vagina is thoroughly disinfected daily by corrosive (1 in 4000) douches, one being given shortly before the application is made. Immediately previous to the introduction of the puncture needle, a small pledget of cotton wool, soaked in 10 per cent. solution of cocain, is placed in the vagina at the proposed seat of puncture. The puncture is made by means of a thin steel electrode, insulated to within three-eighths of an inch of its point.

This is, by a rotatory movement, pushed through the vaginal wall into the tumour for a distance of at least 1½ in., and then attached to the negative pole of the battery. The electrical circuit having been completed by the usual method through an abdominal pad, a continuous current of from 120 to 200 milliamperes is passed through the tumour for from five to ten minutes. On withdrawal of the needle, the vagina is again syringed with an antiseptic, and a pledget of iodoform gauze introduced, to be withdrawn after forty-eight hours.

The two essentials aimed at are—(1) thorough antisepsis, and (2) the introduction of the electrode through the capsule of the tumour, into the substance of the growth (see illustration).

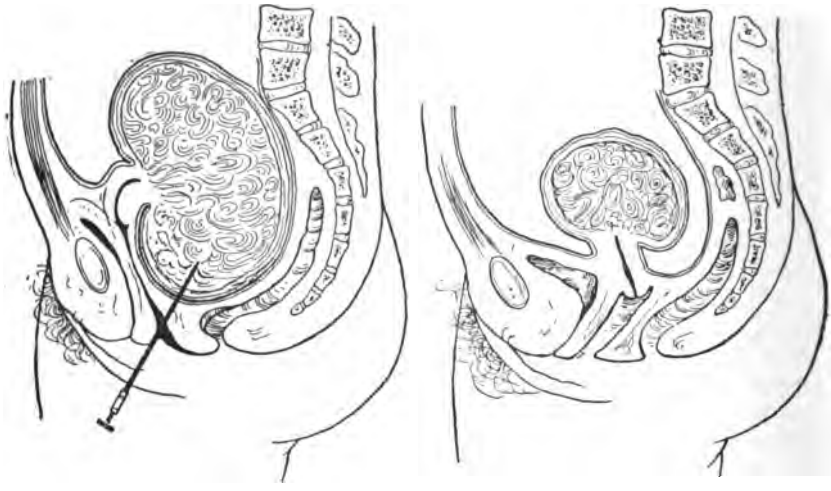

Diagram of Case 1, before treatment, with puncture needle *in situ*.

Diagram of Case 1, after treatment.

By these means, the grave risk of putrid sloughing of the growth, so frequently met with in the earlier days of this method of treatment, are greatly minimised, if not absolutely removed. Too much stress cannot be put on the importance of avoiding any local electrical action on the muscular capsule of the tumour, as by this means, through immediate subsequent contraction of the muscular fibres forming the capsule, we have the seat of puncture in the uterine wall closed, and thus any communication is cut off between the slough formed by the local action of the current and the peritoneum and external vaginal opening.

It is further probable that the induced contraction of the muscular capsule plays an important part in the diminution in size of the growth, and thus any injury to its continuity is urgently to be avoided. In this connection I may add, the more experience I have of the curative action of the constant current on uterine myomata, the more I am inclined to the views I have

previously expressed, that this action is greatly due to the induced contractions of the muscular capsule surrounding these tumours, and by this their nutrition is seriously impeded.

On carefully reviewing the salient features of the result of the electrical treatment on the cases I have just described, the outstanding benefit derived in one and all is the rapid removal of pressure symptoms. This, in the last two, was so immediate in its occurrence as to be difficult to credit; while in the first case, though somewhat slower in its development, it was equally striking. That this result is due to actual shrinkage in the size of the tumour there can be no reasonable doubt. Though inappreciable at first to the examining fingers, the subsequent course of Cases 1 and 2, as well as the want of other reasonable explanation, fully justifies this assumption.

In Cases 2 and 3, symptoms of pressure had only been experienced for a few days, and therefore any great diminution in the size of the tumour was probably unnecessary to relieve the urgent conditions present, and can be accounted for by contraction of the capsule. In Case 1, on the other hand, severe pressure symptoms had been present for months, and were becoming aggravated from the continued growth of the tumour, and thus a considerable diminution in the size of the growth was necessary before they could be removed. That this shrinkage in the size of the tumour was permanent, and not merely a temporary benefit of the treatment (as is averred by many to be the only value of electric treatment), there is no gainsaying. In Cases 1 and 2 no treatment has been adopted for more than eighteen months, yet not only have the symptoms of pressure entirely subsided, but marked diminution in the size of the tumour is palpable. The sudden recurrence of pressure symptoms in Case 1 is easily to be accounted for by the corsets pushing the tumour deeper into the pelvis.

Perhaps the outstanding feature in the effect of the electric treatment in Case 1 is its success after the removal of the uterine appendages had failed. It would appear from the writings of some eminent gynecological surgeons, that many cases previously treated by electricity, subsequently find their way to them to be cured. Fortunately, such a necessity has in my experience been quite the exception. In fact, I cannot recall a single instance in my knowledge. On the other hand, it is but rarely that the electrician seems to have had as yet the opportunity of stepping in where they have failed. The case I have cited is, as far as I am aware, the only one published in which electricity has been adopted after surgery has failed, with the exception of a failure of Thornton's,[1] in which he sarcastically attributes his want of success to the patient falling into the hands of the electricians. How the electrician fared he does not venture to state.

In Case 2, a somewhat striking result was the increase of the

[1] Playfair and Allbutt, *System of Gynecology*, p. 629.

menstrual flow, attended by an entire disappearance of the continuous headache from which the patient complained. This might be deemed probably of the nature of an accidental coincidence, were it not that I have observed the same results in other patients. It would appear that some exceptional cases of fibromyomata, even though associated with an enlarged uterine cavity, instead of increasing the menstrual flow, are actually associated

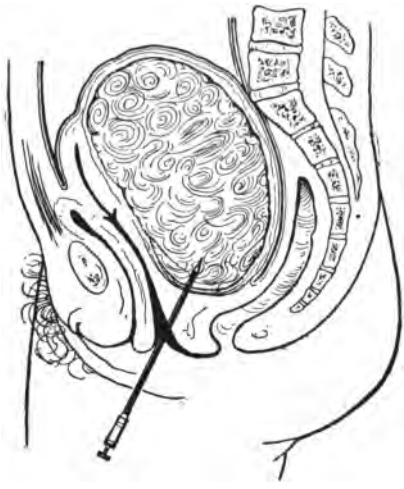

Diagram of Case 2, before treatment.

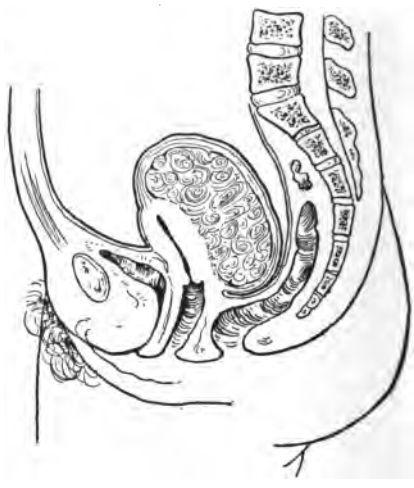

Diagram of Case 2, two years after treatment.

with an abnormal diminution in its amount, which results in the attendant discomforts of plethora, as commonly met with at the menopause. How the electrical treatment effects an increase in the flow it is difficult to conjecture; perhaps it may be by stimulating ovarian activity; but yet the fact remains, that I have several times met with this curious phenomenon, which has been attended by most beneficial constitutional results. Doubtless, ignorance in the mode of action is unsatisfactory; and it is perhaps this want of knowledge which has influenced many in giving electricity so wide a berth, and not a few to condemn it wholesale. But satisfactory results are all-important, and, as far as I personally am concerned, suffice to stimulate me to work contentedly in darkness, as probably by this means alone will any rays of light be attained.

A further point of very considerable practical bearing is that in Case 1, after thirty puncture applications, the tumour rose out of the pelvis into the abdominal cavity. It thus shows that if judicious puncture methods are employed, there need be no fixing of the growth by dense adhesions to surrounding structures; and thus the argument used by certain writers, that electrical treatment seriously increases the difficulties of future operation by

causing dense adhesions, must, so far as this case proves, be absolutely groundless. Certainly, where the old crude methods of puncture were employed, such a result was almost a necessity; but with the introduction of the exposed portion of the electrode well within the tumour, as now employed, this complication is efficiently avoided.

The practical results obtained from the treatment of the above cases by electro-puncture, I think, thoroughly justify its adoption. Doubtless but three cases are too few from which to form definite conclusions; but cases necessitating the employment of puncture methods are fortunately rare, and where the intra-uterine method can be undertaken it should always be adopted, the results being equally satisfactory, less irksome to carry out, and associated with probably less risk to the patient. As I have already stated, the cases cited represent my entire personal experience in the electro-puncture methods, or, in other words, were all I have seen (among over eighty cases in which I have adopted electrical treatment) in which I have been unable to introduce the electrode into the uterine cavity

If such beneficial effects are to be got from conservative methods in the treatment of fibromyomata, it is indeed surprising how little its adoption is advocated, not to say how heartily it is abused.

Maybe this is due to medical "electricity" forming the trade-mark of so many advertising quacks, which thus shocks the modest conservatism of the high-toned professional mind; maybe, on the other hand, it is the prolonged irksome nature of the treatment which prevents its adoption by the busy gynecologist; or perhaps its methods are too simple and commonplace to induce the laparotomist to leave the beaten track of the linea alba, on which he is ever trying to establish world records of statistical successes. But whatever the cause may be, I think there can be little doubt, from a conservative point of view, that the electrical treatment of fibroids has not as yet had bestowed upon it the consideration which its results warrant.

It has its failures; but what methods have none? It has, however, no mortality (this I state from personal experience and observation), and here, undoubtedly, rests the main argument in favour of its adoption before other heroic measures are attempted.

Removal of the appendages has, in the hands of the average operator, a mortality of 8 per cent., and in a further 10 per cent. fails in any way to benefit the patient. According to Croom, 20 per cent. of women continue to menstruate after this operation. Further, in a considerable proportion of cases in which this operation has been begun, it is unable to be completed.

Hysterectomy, in the hands of the most able and finished operators, has a mortality of 10 per cent., and an average mortality of quite three times that amount.

Surely, then, if electricity as a conservative measure has any

beneficial results whatever (and I can personally vouch for a permanent removal of symptoms for over two years of over 70 per cent. of cases), surely it cannot be altogether rejected and refused a legitimate trial.

The two main conclusions which may be arrived at from the cases quoted seem to me to be—

1. That electricity has a decided curative action in some cases of fibromyomata, when nothing else short of severe surgical measures can be recommended.

2. That from the absence of mortality in its employment, and also in that it in no way increases the danger of subsequent operation, electricity should, in a large proportion of cases of fibromyomata, be employed before recourse be had to radical surgical interference.

I do not wish to be sentimental, but I appeal to human inclinations. In a case of one who is near and dear, who suffers from chronic invalidism as the result of a uterine fibromyoma, I ask whether many of us would subject her to an 8 per cent. risk of life, with a further 15 per cent. risk of failure by removal of the ovaries, or the terrible mutilation of hysterectomy, before at least trying all conservative means at our disposal. Personally, I unhesitatingly say I would decline, and thus would give electricity, as the most efficient conservative treatment, an honest trial. No harm is done, no valuable time is lost, for in the majority of instances fibromyomata do not call for immediate interference. If it do fail—which in my experience is the exception—we can then proceed with an easy conscience to other more radical and drastic measures. Why ovaries and uteri should be treated with less courtesy than other important organs (not to mention the teeth, which have bestowed upon them in many instances infinitely more care and trouble to conserve them) is an enigma difficult to explain. Perhaps woman is herself to blame, the tendency of the age being to minimise the importance of these reproductive functions, of which her matronly ancestors were so proud.

If such be so, it is little credit to the medical profession to foster the idea by condemning these organs, for but minor offences, to capital punishment without any option.

Dr Lackie said that he had had an opportunity of watching one of the cases which Dr Haultain had recorded. The patient at one time seemed to him to be dying from pressure symptoms and exhaustion, but the effect of the electrical treatment which Dr Haultain carried out was such, that now she seemed perfectly well. Hysterectomy was out of the question, as the patient almost certainly could not have borne the shock of the operation; and as it was impossible to reach the interior of the uterus on account of its displacement, he did not know any other means that would have reduced the tumour and so saved the life of the patient. Dr

Lackie had recently observed in another case the effect of electricity in causing contraction of the uterus. Under this treatment a bleeding sessile fibroid had rapidly become polypoidal, and been easily removed, with great relief of symptoms.

Dr Haultain replied.

VII. ASCITES IN A SEVEN-MONTHS' FŒTUS AS A HINDRANCE IN LABOUR.

By Dr Mark Günsburg, Charkow, Russia.

Translated and Communicated by Dr J. W. Ballantyne.

The patient was a woman, 31 years of age, advanced as far as six and a half months in her tenth pregnancy. Her two last gestations ended prematurely at the seventh and eighth months respectively on account of hydramnios; both the infants were dead-born. The confinements were complicated by severe uterine hæmorrhage and puerperal disease.

Although the woman was now pregnant six and a half months, yet the circumference of her abdomen was 125 cms. She was lean and weakly, and suffered from dyspnœa, pains in the lateral parts of the abdomen, and œdema of the feet and labia. The uterine dulness extended on the right side into that of the liver, on the left side and superiorly there was a small area with a tympanitic note, but below and laterally there was dulness everywhere; so that in addition to the pregnancy the woman suffered from ascites. The heart was normal, and the urine free from albumen.

In the course of the following fortnight the patient took $\frac{1}{6}$ gr., thrice daily, of the muriate of pilocarpin, which had been prescribed for her by another medical practitioner. Its operation was ineffectual; no signs of premature labour were called forth; the abdominal circumference had reached 133 cms. Towards the end of the seventh month the fœtus died. Some days later labour came on spontaneously; it progressed slowly with weak pains and profuse bleeding; the membranes burst with the cervical canal yet undilated; the quantity of water was enormously large. After 10 grains of ergot in powder had been given, the pains increased in strength and the head and upper part of the body were born; but the termination of the labour was delayed, and the cause of this was found to lie in an anomalous distension of the abdomen of the fœtus. While I was preparing Blot's perforator for the puncture of the infant's abdomen, Prof. K. Selew, who had been called in consultation, tried manual extraction, and succeeded in his attempt with the exercise of great force. The circumference of the fœtal abdomen was 45 cms., *i.e.*, from 11 to 12 cms. greater than that of the head of a full-time child. A post-mortem examination of the child was not permitted.

The puerperium progressed from the second to the fifth day

with an endometritis, the temperature being 40°·8 C. After the uterus had twice been washed out, and many vaginal injections given, this state of things improved. The woman had a very slow recovery. The liver was very much enlarged; it was displaced downwards and to the right, so that its margin reached to the right anterior superior iliac spine. The spleen was also to be felt two fingers' breadths below the ribs.

The anamnesis revealed that the husband of the patient was suffering from the secondary manifestations of syphilis; in the woman herself there were no objective appearances of syphilis, with the exception of the death of the infants in the last three successive pregnancies. The exact nature of the hepatic and splenic enlargement remained doubtful.

VIII. NOTES ON SEVERAL PREPARATIONS FROM THE OBSTETRICO-GYNECOLOGICAL CLINIC AT CHARKOW, RUSSIA.

By Dr MICHIN, Assistant to the Clinic.

Translated and Communicated by Dr J. W. BALLANTYNE.

1. ON the 13th of April 1895 a multipara, 23 years of age, was delivered in the above-named clinic. The two earlier confinements had been normal. The pelvic measurements were as follows:—Interspinous diameter, 24·5 cms.; intercristal, 27 cms.; intertrochanteric, 31 cms.; external conjugate, 19 cms.

External examination revealed a longitudinal presentation of the fœtuses; the fœtal heart-beat was at the rate of 132 per minute. The presentation was a right occipito-posterior. The first stage of labour lasted 3 hours, the second 3 hours and 47 minutes. After the birth of the head, the hands, the trunk, and the feet of the child were extracted, so that the first infant remained attached to the vulva only by the part of its trunk which was connected with the second fœtus. Then the feet of the second twin were brought out, then its trunk, and lastly its head followed. The extraction of both fœtuses occupied seven minutes, and was accomplished without the dilatation of the mother's genitals by incisions.* The uterus was washed out with sublimate solution (1 in 6000), and 2 per cent. carbolic lotion. The puerperium ran a normal course.

Both infants were dead born, and were of the female sex. They weighed 4000 grammes, and had the following measurements:—

	First Infant.	Second Infant.
Circumference of head, . . .	33·0 cms.	32·5 cms.
Biparietal diameter, ...	8·0 „	8·0 „
Bitemporal diameter, ...	6·5 „	6·0 „

* According to Hohl and Playfair the great majority of united twins have been born without artificial aid.

	First Infant.	Second Infant.
Occipito-frontal diameter, . . .	10·0 cms.	10·5 cms.
Occipito-mental diameter, . . .	11·0 „	11·0 „
Sub-occipito-bregmatic diameter, .	9·0 „	8·5 „
Transverse diameter of the shoulders,	10·0 „	9·0 „
Transverse diameter at hips, . .	6·0 „	7·0 „
Distance from crista occipitalis to the umbilicus, ...	22·5 „	22·5 „
Distance from the umbilicus to the symphysis, ...	22·0 „	22·0 „

The post-mortem examination of the fœtuses revealed the following facts:—There was a common sternum and a single large heart. Into a single auricle, common to both fœtuses, opened two superior and two inferior venæ cavæ and the pulmonary veins. The ventricles were three in number, of which two belonged to one infant, and a single one to the second child. From the last named there arose a single aorta. The pulmonary artery was obliterated before its entrance into the ventricle. Into the two first ventricles opened, in a normal manner, the aorta and the pulmonary artery of the second child.

Among the other organs were anomalies. The two fœtuses had a large liver with two gall bladders, whose ducts united and opened into the intestine at the place where the two duodeni united. Each fœtus had a single stomach.

To the two fœtuses belonged a single umbilical cord, 56 cms. in length, with four vessels contained in it. The cord was inserted at the middle of the lower surface of the place where the two children were united. The placenta was single and weighed 550 grammes; it measured 21 cms. by 15 cms.

The fœtuses belonged to the group of the *thoracopagous double terata.*

2. Another similar preparation was sent by a doctor in the country to the Clinic in 1891. Dr Oldekop, who attended the confinement, described it as a difficult one, which could only be completed after the first presenting infant had been decapitated. The fœtuses were females, and their weight was 3900 grammes. Measurements:—

	First Fœtus.	Second Fœtus.
Head circumference, . . .	35 cms.	34 cms.
Total length, ...	46 „	44 „
Occipito-frontal diameter, . .	11 „	11 „
Biparietal „ . .	10 „	9 „
Bitemporal „ . .	9 „	9 „
Occipito-mental „ . .	13 „	12 „
Sub-occipito-bregmatic diameter,	10 „	10 „
Transverse diameter of shoulders,	8 „	9 „
„ „ hips,	8 „	9 „

The umbilical cord was 50 cms. in length, and was inserted on the under surface of the place of union of the two fœtuses. The placenta weighed 400 grammes. The two infants had a single sternum. The clavicle and scapula are present on the right side only in the right-sided infant, in the other infant both clavicles are normal.

3. The third preparation consisted of united twins of the variety *dicephalus tribrachius tripus* (Förster). The specimen was sent to the Clinic in 1886, and after being kept in spirit for ten years, weighs 1700 grammes. Each fœtus had a heart and lungs; the two hearts lay in one pericardium; there was one sternum for the two; there was only one clavicle but two scapulæ for each. In the fused upper limb, there was one humerus, but two ulnar and two radial bones were present. The vertebral columns were separate above, but united below in a single sacrum. There was a single liver, spleen, and intestinal canal for the two fœtuses. The pelvis was split anteriorly (pelvis fissa), there was ectopia vesicæ urinariæ, and the penis and scrotum were double, there being one testicle in each scrotum. On the posterior aspect of the sacral region was a third imperfectly-developed lower limb, which had no femur, but only the bones of the leg and one large digit.

4. Another preparation showed similar osseous defects. It came from a ii.-para delivered in the Clinic on Jannary 15, 1894. The patient's first confinement had been terminated by forceps; the second took place spontaneously, lasting thirteen hours. The child was 46 cms. in length, and weighed 2650 grammes. Measurements: Circumference of head, 32·5 cms.; O.F., 10·5 cms.; Bi-P., 8 cms.; Bi-T., 6·5 cms.; O.M., 12 cms.; S.O.B., 8 cms.; transverse diameter of shoulders, 10 cms.; and of hips, 8·5 cms. It was a female infant, and showed *pelvis fissa, ectopia vesicæ urinariæ,* and *prolapsus uteri incompleta.* On the everted vesical mucosa, which bleed freely, could be seen the openings of the ureters. The mother and child left the Clinic on the ninth day of the puerperium, and on the twelfth day the child died from hæmorrhage from the bladder.

5, 6, and 7. Of the three *hemicephalic fœtuses* in the collection, only one was born in the Clinic. It was a face case, ending without artificial interference. The spirit-preparation weighed 1550 grammes. The cranial bones showed defective development. The frontal, occipital, parietal, and temporal bones were absent. The eyes were large and projecting (exophthalmus), and the ears were large and overhanging. The length of the child was 35 cms., the breadth of the shoulders 10 cms., and of the hips 9 cms.

The two other hemicephali were sent into the Clinic; both were females.

8. A *micromelus* was born in the Clinic on the 29th October, 1895. The mother was a well-built, healthy vi.-para. The labour

lasted eighteen hours, and was a brow presentation. The child lived twenty-four hours. The head and trunk were normal, but the extremities were relatively very small, and the toes were turned backwards. The child, a female, weighed 2600 grammes.

9. An *amelus* was also born in the Clinic. There were no digits on one foot, and in the second lower limb it seemed as if the femur had been amputated at the middle.

MEETING VI.—MAY 12, 1897.

DR ALEX. BALLANTYNE, *President, in the Chair.*

I. Arthur Gibson, M.B. C.M., Queen's Crescent, Glasgow, and J. Macmillan, M.B., D.Sc., F.R.C.P.E., were elected Ordinary Fellows of the Society; and Dr Michin, Gynecological Clinic, Charkow, Russia, and Dr Mark Günsburg, Charkow, Russia, were elected Corresponding Fellows.

II. *Dr J. C. Kynoch* showed the UPPER HALF OF THE UTERUS from a supposed case of INTERSTITIAL PREGNANCY on left side of fundus, divided into two compartments—an upper one, where the ovum had developed and ruptured through the muscular substance of the fundus; the lower one, part of the cavity of the uterus proper, the walls of which are thickened and lined with a decidua. Between the two cavities there is a thin incomplete septum. The left Fallopian tube appears to communicate with the sac, the right does not. Fœtus corresponding to about fourth month. Placenta with battledore insertion of the cord. (To be reported on by Committee.)

III. *Dr N. T. Brewis* showed a SMALL OVARIAN TUMOUR, consisting chiefly of one thin-walled cyst, which he had removed from a patient that day.

IV. INTERSTITIAL PREGNANCY, WITH NOTES OF A CASE.

By J. A. C. KYNOCH, M.B., F.R.C.P. Edin., Dundee.

THE subject of ectopic gestation is one which has received considerable attention from several of the Fellows of the Society during the past few years. We have heard papers treating of the pathology, etiology, diagnosis and treatment of this condition. Those contributions have for the most part referred to the tubal

form, but as far as I am aware, a case of interstitial or tubo-uterine pregnancy has not been reported, and, on account of the rarity of its occurrence, I thought it of sufficient interest to warrant me in bringing the notes of such a case before your notice. The following statistics testify to the rarity of such cases. Martin of Berlin observed only one example of this form in seventy-seven cases of ectopic gestation. Lawson Tait observed one in seventy-six cases, and Schrenck, from a collection of six hundred and ten cases, found only fourteen of the interstitial form. By interstitial pregnancy is generally understood that form where the fertilised ovum lodges in that part of the Fallopian tube which traverses the uterine wall and there undergoes further development. This variety has, however, by some authorities, been further subdivided according to the exact position in which the ovum undergoes its further development. Dezeimeris, for example, describes four varieties of gestation in the uterine end of the tube,—first, tubo-uterine interstitial pregnancy, where the ovum develops in the uterine end of the tube, and by its further growth pushes through the muscular wall of the uterus from below upwards, but always remains covered by the thinned-out wall of the tube; second, utero-interstitial pregnancy where the ovum, by its increased growth, pushes itself through the wall of the tube into the muscular substance of the uterus, and finally becomes covered by the expanded uterine fibres only; third, tubo-uterine pregnancy, where the ovum develops in the Fallopian tube, and by its further growth pushes itself into the cavity of the uterus—such a form would be considered as an unusual form of uterine pregnancy; fourth, utero-tubal abdominal pregnancy, where the placenta is situated in the uterus, the umbilical cord in the tube and the fœtus free in the abdominal cavity. Hennig holds that the only cases that can be regarded as tubo-uterine are those in which one part of the ovum is situated in the uterus and the other part in the tube. Under interstitial pregnancy he includes those cases where the ovum develops in the uterine end of the tube, and he defines as intramural pregnancy those cases where the ovum grows through a corresponding portion of the tube and pushes itself into the neighbouring muscular layers of the uterus. The case which I now report would probably come under that variety where the fertilised ovum had become attached to the innermost part of the left Fallopian tube, and by its subsequent growth had pushed itself into the muscular substance of the uterus, and finally become covered by the distended muscular fibres of the uterine wall.

Mrs D., 25, was admitted into the Dundee Royal Infirmary on January 27, 1897, complaining of pain in the back, persistent vomiting and frequent micturition of three months' duration. She had been under treatment in the Infirmary two years ago, when she complained of pain in the right iliac region, especially during

menstruation, and which she dated from the birth of a child three months previously. On examination at that time the uterus was found retroflexed and movable; there was some tenderness in the right fornix, with enlargement of the corresponding ovary. She was treated with douches and ichthyol plugs, and later the uterus was replaced and a pessary introduced. Her menstruation began at the age of 14, and previous to her marriage, seven years ago, she had always been regular. Her previous health and family history were good. She had been four times pregnant. The first pregnancy, six years ago, child full time, healthy, labour natural. The second pregnancy ended in miscarriage at the third month. The third pregnancy, two years ago, child healthy, labour natural. The fourth pregnancy refers to the present case. Her last menstruation ceased on the 17th October, *i.e.*, three months previous to admission to the Hospital.

On examination she was noted to be very anæmic and poorly nourished. Breasts fairly developed, contained milk, and there was well-marked areolar pigmentation. Palpation of the abdomen caused pain in the epigastric and right iliac regions, and a swelling was felt slightly to the right of the middle line, reaching to a point midway between umbilicus and symphysis. Per vaginam, cervix soft, os patulous, admitting the point of the finger; slight leucorrhœal discharge; no swelling in either fornix. Bimanually there was found a swelling apparently continuous and moving with the uterus, reaching upwards to a point three inches below the umbilicus. On passing a speculum there was noted a well-marked purple discoloration of the vaginal mucous membrane. The sickness and abdominal pain complained of on admission continued during her stay in the Hospital. The case being regarded as probably one of extra-uterine pregnancy, operation was proposed, but this the patient declined, and by her own desire left the Infirmary ten days after admission. A week later she again presented herself at my out-patient gynecological department, still complaining of sickness, frequency of micturition, and constant pain across the lower part of the abdomen. She still foolishly persisted in remaining at home.

Feeling certain that the case was an unusual one, I advised her to be examined under chloroform. This she consented to have done at her own home, a miserable one-roomed house. Upon examination then, I found the swelling previously noted reaching upwards to a point two and a half inches below the umbilicus, continuous with the uterus, and resembling at its upper part a tense ovarian cyst, the lower part from its consistence being obviously the body of the uterus; both fornices were free, but as the swelling extended rather to the right of the middle line, it could be best felt through the right fornix. There could be no doubt that the patient was pregnant, but what the exact nature of the case was puzzled me. I passed the sound, and found the

uterus measured a little over three inches. I thought I could exclude tubal pregnancy—first, on account of the absence of any symptom pointing to rupture of the sac at a period when this accident usually happens in such cases, viz., twelfth to the fourteenth week; secondly, the complete absence of any swelling in either fornix, and the central position of the abdominal swelling. It curiously happened that a few days previous to this case coming under my observation, I had read in the *Centralblatt für Gynäkologie* of December 19, a paper by Rosenthal of Warsaw, on what he described as a case of intramural pregnancy. Clinically this case corresponded in almost every point to my own case, and from the information I got through reading this case, the possibility that I might be dealing either with a case of interstitial pregnancy, or pregnancy in a rudimentary horn of a double uterus, suggested itself to my mind.

I urged upon the patient the necessity of her returning to the Hospital for operation, but this she refused to do. Her condition naturally did not improve, and she became worn out from want of sleep and on account of the persistent abdominal pain and sickness. Knowing that if the case were one of interstitial pregnancy it had probably reached the fourth month, and that therefore rupture might occur at any moment, with a certain rapid fatal termination, I advised her friends to have the operation done without delay. Getting their consent, and having made the surroundings of the patient as suitable as possible, I operated with the assistance of Drs Foggie and M'Leod.

On opening the abdomen there presented in the middle line a tense thin-walled cyst about the size of a melon, continuous with the uterus below. Both ovaries and tubes appeared normal. I punctured the cyst, and liquor-amnii escaping, I enlarged the opening and extracted a living fœtus. On dividing the cord I had evidently exerted some traction on the placental attachment, as this was immediately followed by a gush of blood. I then pulled off the placenta, and what represented the sac came away with it. There was an opening on the fundus of the uterus admitting the point of two fingers. From this opening the hæmorrhage continued very profuse, so that I gave up the idea of suturing the uterine wound. I then ligatured the broad ligament on either side close to the uterus, put a strong temporary ligature round it, amputated above this point, and brought the mucous and peritoneal layers of the stump together with continuous catgut suture, and having satisfied myself that oozing had ceased, I returned the stump and closed the abdominal wound with interrupted silkworm gut sutures.

The patient stood the operation well, and her condition continued satisfactory until early on the morning of the third day, when I was summoned to see her on account of sudden abdominal pain. I then found her pulse small and rapid as compared with

the previous evening, her expression anxious, and there was for the first time hæmorrhagic discharge from the vagina. The sudden onset of these symptoms pointing to hæmorrhage, I re-opened the abdomen. I found a considerable quantity of blood in the pelvis, with oozing from the stump. I sponged out the abdomen, and as the uterus had not been amputated close to the vagina, I drew up the stump and fixed it to the lower part of the abdominal wound, as in the ordinary extra-peritoneal treatment of the stump. Attempts to inject saline infusion into the rectum were useless, as the fluid was not retained for any time. She showed no signs of improvement after the re-opening of the abdomen, and died from exhaustion twenty-four hours later. The parts removed consist of the upper parts of the uterus divided into two compartments, the lower one the cavity of the uterus proper, the walls of which are enormously thickened, and lined with a well-marked decidua, and above this, and separated from it by a thin septum, the sac where the ovum had developed, and out of which it had pushed itself through the muscular substance of the uterus. A probe passed through the left Fallopian tube appears to communicate with this cavity; the right does not. The fœtus corresponds to about the fourth month. Placenta, with battledore insertion of the cord. The wall of the sac evidently consisted of amnion and peritoneum only. The termination of cases of interstitial pregnancy, as compared with tubal form, is invariably fatal, on account of the date of rupture of the sac being later, and as a consequence more copious free hæmorrhage into the abdominal cavity. The only favourable cases for operation are those that come under observation previous to rupture of the sac, a very rare occurrence, and exemplified by the present case. With reference to the treatment which I adopted, I regret my attempting to have treated the pedicle intra-peritoneally in place of the ordinary extra-peritoneal method. Whatever may be the drawbacks of the latter, it has certainly the outstanding advantage of giving complete control over the occurrence of secondary hæmorrhage, an event which was the cause of the unfortunate termination of my case.

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Dr Barbour said there could be but one opinion as to the paper just read, and especially as to Dr Kynoch's pluck in operating under such adverse conditions. Undoubtedly it was the only chance for the patient, and it was unfortunate that the accident of secondary hæmorrhage prevented a successful result. He was not sure that it was a case of interstitial pregnancy, on account of the relations of the tube and round ligament. It might be a case of pregnancy in a separate uterus, with a rupture of the uterine wall and hernia of the ovum.

Dr Kynoch thanked Dr Ferguson for his suggestion to have the specimen of supposed intestitial gestation remitted to a Committee for more minute examination.

On the suggestion of Dr Ferguson, and with the sanction of Dr Kynoch, the Chairman nominated a Committee, consisting of Drs Barbour, Berry Hart, and Haultain, to examine and report on Dr Kynoch's specimen of interstitial pregnancy.

V. ON VAGINAL HYSTERECTOMY BY DOYEN'S METHOD: WITH SIX SUCCESSFUL CASES:

By A. H. Freeland Barbour, Assistant Gynecological Physician to the Royal Infirmary, Edinburgh.

The operation of extirpation of the uterus has an interesting history.[1] Naturally it was done in the first instance when the organ was found already prolapsed; the first extirpation of the prolapsed uterus for cancer, which is the subject we have to discuss in this communication, being performed in 1560 by Andreas A. Cruce. The non-prolapsed uterus was removed *per vaginam* for the first time in 1822 by Sauter of Constance. The patient recovered, but died four months later from pneumonia. In 1828 Blundell also extirpated the cancerous uterus successfully *per vaginam*. The patient died one year afterwards from cancerous stricture of the rectum. A year later, Recamier placed the operation on a scientific basis by ligaturing the base of the broad ligaments.

For the next fifty years attention was chiefly directed to hysterectomy for fibroids. The large majority of the operations done in this connection are not, however, hysterectomies in the strict sense of the word, as a portion of the uterus is generally left as a pedicle, the treatment of which has given rise to so much discussion.

The modern history of extirpation of the uterus for malignant disease dates from 1878, when Freund described his operation for removal of the uterus by the combined method, that is to say, by abdominal and vaginal incision: an incision was made through the abdominal walls in order that the uterus might be got at, and

[1] See Hegar and Kaltenbach, *Operative Gynäkologie:* Stuttgart, 1891, S. 392.

the broad ligaments ligatured in three portions, the broad ligament pedicles being afterwards drawn down through the opening in the vaginal vault. Two years later, Ahlfeld collected statistics of Freund's operation, which showed a mortality of 71 per cent. for the 93 cases collected—a mortality which condemned the operation.

About the same time extirpation began to be carried out from *the vagina alone*, by an operation, the technique of which was elaborated by Czerny, Billroth, Schroeder, and Martin. By this method a much better result was obtained, the mortality being only 25 per cent. in 32 cases collected by Hegar and Kaltenbach. This diminished mortality showed that the vaginal method was immeasurably superior to the abdominal or the combined. There is nothing more striking than the difference in the appearance of a patient who has undergone an operation by the vaginal as distinct from the abdominal method. Even when the uterus and ovaries have been cut out *per vaginam* the patient looks no worse than one who has undergone repair of the perineum, and shows a striking contrast to one who has gone through an abdominal section. The advantages of the former method are that you reach the pelvic organs by a short route instead of passing through the abdominal cavity with the risk of handling the bowels, and introducing septic matter by fingers, sponges, or instruments; and also that there is free drainage obtained after the operation.

One drawback to the vaginal method is the difficulty of getting at the broad ligaments so as to control efficiently the blood-supply. To do this by ligature implies a more or less tedious operation, and there is loss of blood during the operation, which according to Hegar and Kaltenbach was the chief cause of mortality, at least in the earlier cases of the vaginal operation. It is the use of the clamp instead of the ligature, with the advantages of this method, which form my reason for bringing this communication before the Society.

As to who first suggested the use of the clamp, the Landaus, in their valuable monograph,[1] give the credit of it to M. B. Freund, in a paper on W. A. Freund's operation[2] in which he proposes to use a clamp instead of the ligature; but Sänger[3] rightly points out that he suggested its use in the combined operation, and that he says it would be inadvisable in the vaginal one. It would seem, therefore, that the credit belongs, as Pozzi says, to Spencer Wells, who in 1882 suggested the use of the clamp for the

[1] *Die vaginale Radicaloperation, Technik und Geschichte*, von Prof. D. Leopold Landau and Dr Theodor Landau: Berlin, 1896.

[2] *Zeits. f. Geb. u. Gyn.*, 1881, Bd. vi, S. 358.

[3] "Zur Geschichte der vaginalen Hysterektomie nach Doyen:" *Cent. f. Gyn.* 1896, No. 51.

vaginal operation.[1] Although, however, the French operator courteously gives an Englishman the credit of the suggestion, it is to the distinguished French surgeons Péan and Richelot that the honour of making the clamp a practical success is due. I need not trouble you with the discussion as regards priority between these two operators, which turns largely upon the use of the clamp by accident as against premeditation, and the use of it alone as against using it along with the ligature. Practically they both began to use it about the same time, Péan's first operation being in June 1885, and Richelot's in July 1886.

Doyen of Rheims has also used the clamp with great success, introducing new methods, if not also new principles, so that his operation differs essentially from the other two. French Gynecologists distinguish between the "preventive" use of the clamp, in which it is put on during the operation as a temporary means of checking bleeding, and the "definitive" or "final" use of it, in which it is put on at the last stage of the operation as a permanent means of arrest. Péan used the clamp in the first sense, clamping the base of the broad ligament so that he might split the cervix laterally and excise it before removing the uterus. Doyen does not apply the clamp until the last thing in the operation, any bleeding during it being checked by the traction on the uterus. Further, Péan and Richelot apply the clamps from below upwards, Doyen where possible from above downwards. Doyen has also emphasised the advantage of splitting the uterus anteriorly, which causes it to collapse, and also allows the operator to take a fresh hold along the free margin of the incision. We shall describe shortly the operation as we have done it, following Doyen's method,[2] and then discuss the cases with some points suggested by them.

The patient is prepared beforehand by repeated vaginal douches and packing the vagina with iodoform gauze. In a case of cancer of the cervix it is of course impossible to get the field of operation thoroughly cleansed, but the nearer we can approach to this the better. Some have gone the length of scraping away the diseased mass and washing the field with alcohol so as to destroy the cancerous surface and lessen the risk of inoculation of cancer cells on fresh cut surfaces. Whether better results will be got as to non-recurrence by these drastic measures time alone will show.

[1] The passage runs :—"I think it extremely probable that the operation as hitherto practised might be very much simplified by drawing down the uterus, separating its attachments to the vaginal wall all round as near to the uterine substance as possible, or exactly where the peritoneum is reflected off from its walls, securing any bleeding vessel, as it is divided, by pressure forceps, not using ligatures, but leaving the forceps hanging out of the vagina for two or three days until all danger of hæmorrhage has ceased."—*Ovarian and Uterine Tumours:* London, 1882, p. 526.

[2] As described in his beautifully illustrated monograph—*Deux Procédés inédits d'Hystérectomie abdominale et vaginale:* Paris, 1893.

But it seems to us that antiseptic douching and packing with iodoform gauze is all that is necessary. When the vagina is contracted, as in nulliparæ, distention with a bag beforehand, as Doyen recommends, procures more room.

The instruments required are spatulæ, scissors, strong volsellæ

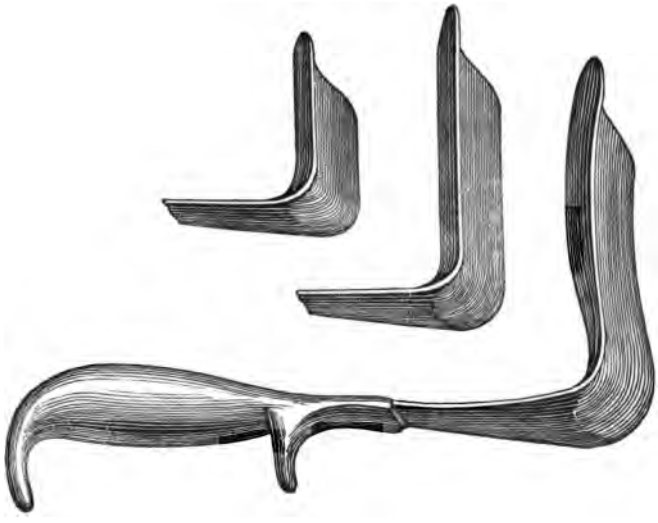

FIG. 1.—Doyen's Spatulæ for Vaginal Hysterectomy.

(like bullet-forceps), and clamps. The spatulæ (Fig. 1) are modified Sims' specula, for holding back the anterior and posterior vaginal walls. Doyen's clamps (Fig. 2) have the special advantage

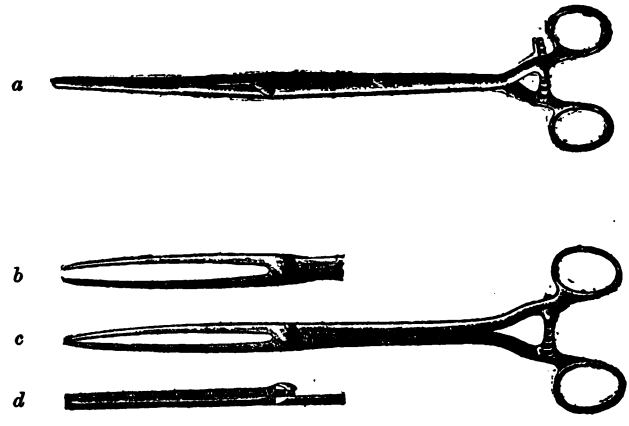

FIG. 2.—Doyen's Clamps. (*a*) compressed, (*b*) blades open, (*c*) closed, (*d*) inner face of blade.

of elastic blades which are concave, so that they touch first at the points, and only on firm compression throughout (see Fig. 1). This insures compression at the points of the instrument which are in relation to the base of the broad ligament where the large vessels are. Further, each blade is grooved (Fig. 2 *d*) so that the tissue bulges into the space and all risk of slipping is prevented. The cervix being laid hold of laterally and drawn down, a circular incision is made with the scissors through the vaginal mucous membrane. Anteriorly it skirts the os externum, so as to lessen the risk of going into the bladder. Posteriorly it runs more in the fornix, as there is little danger of injuring the rectum (see Fig. 1 in Plate).

Ségond makes a lateral incision in the fornix extending outwards from the circular one, so as to facilitate the separation of the bladder. It is a noteworthy fact that in his 400 cases Ségond has not once injured the ureter. Landau, and more recently Condamin, have recommended leaving a bridge of mucous membrane uncut in the fornix; that is to say, a crescentic incision is made before and behind the cervix, but these are not made to unite at the sides until a later stage in the operation. Condamin does this to lessen the risk of injuring the uterine arteries until the clamp is to be applied.

The pouch of Douglas is now cut into by alternately clipping with the scissors and feeling with the finger, until the peritoneal cavity is reached. Should the peritoneum retract or the pouch be obliterated by adhesions, so that the peritoneal cavity is not at once reached here, the separation of the uterus anteriorly is gone on with. This is done with the finger, great care being taken not to injure the bladder (Fig. 5 in Plate). As soon as the cervix is so far free, the uterus is split with the scissors in the middle line anteriorly (Fig. 2 in Plate).

Where the uterus is enlarged by fibroid masses, a V-shaped incision is made instead of the mesial one; and the V-shaped piece cut out in successive fragments—1, 2, 3, 4, 5, 6 in Fig. 4 in Plate.

The cut margins are caught in volsellæ, and more of the uterus pulled down. The anterior wall is still further split, till the utero-vesical peritoneum is reached. When the peritoneal cavity has been cut into, the opening is enlarged by pushing in the scissors and separating their blades. The fundus is seized in the forceps and pulled out, and the clamps applied. The broad ligament is caught between the finger and thumb, or between the index fingers of both hands, the finger tips meeting beyond the base of the ligament so as to ensure that nothing is caught in the clamp except the ligament. The clamp is introduced from the upper margin of the ligament downwards, so that its points are at the wound in the fornices. It lies beside the uterus (Fig. 6 in Plate), or if the appendages are removed as well, it is placed external to these. A smaller clamp is passed on the inner side of the big

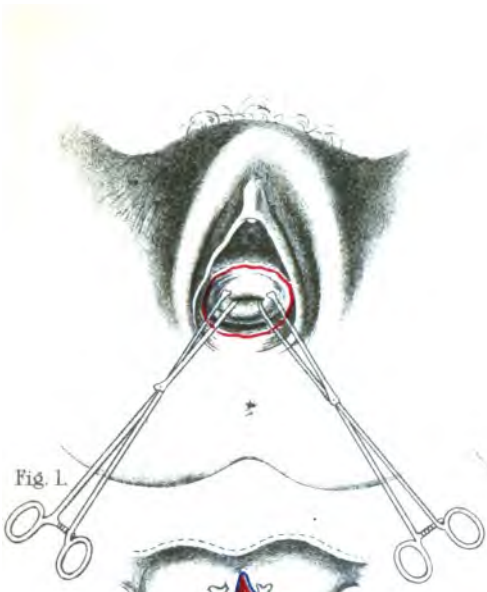

Fig. 1.

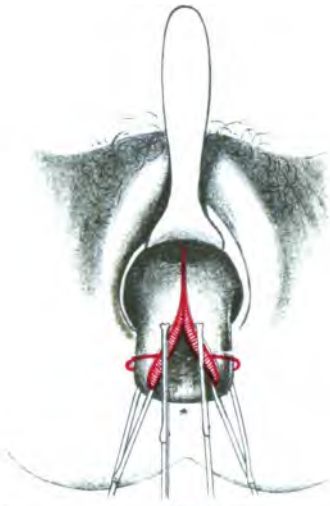

Fig. 2.

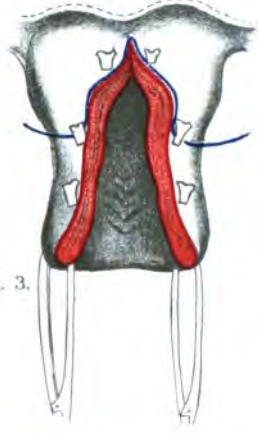

Fig. 3.

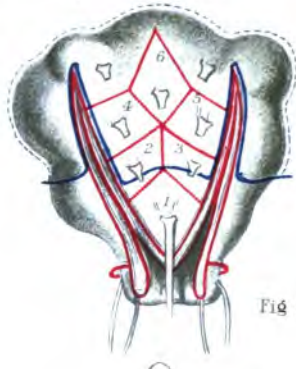

Fig. 4.

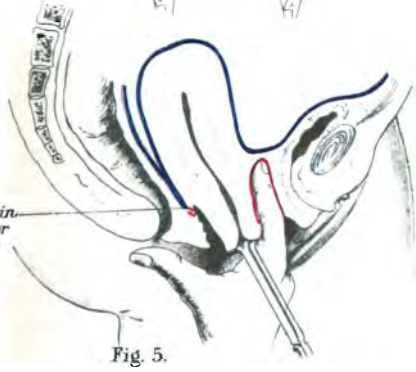

Fig. 5.

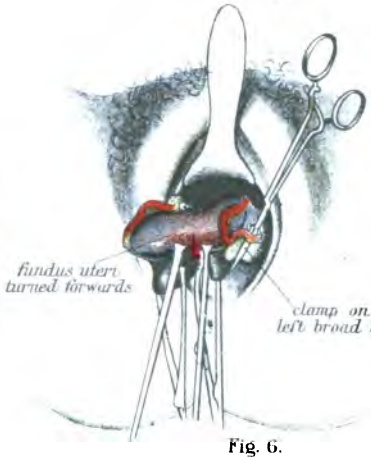

Fig. 6.

VAGINAL HYSTERECTOMY WITH CLAMPS (DOYEN).

FIG. 1. Incision in fornices. FIG. 2. Uterus drawn down and anterior wall divided. FIG. 3. Splitting of anterior wall; FIG. 4 shows the V-shaped incision. FIG. 5. Separation of bladder. FIG. 6. Application of clamp.

one, that is, between it and the uterus, for safety; and the uterus cut away. The handle of the clamp is now turned down so as to lie in the axis of the vagina, which means some twisting of the broad ligament. Instead of lying in the axis of the pelvic inlet, it is rotated through a quarter of a circle until it lies in the axis of the outlet. A tampon of iodoform gauze is now introduced between the clamps, and the ends of the gauze thrown round their handles where these might press injuriously on the vulva. In the after-treatment the bladder should be emptied by the catheter for two days to prevent soiling of the vaginal tampon. Sometimes considerable pain is complained of (much more than after ligatures have been used), which may be due to the traction on the ligaments by the clamp. In two of my cases this was so marked as to call for morphia. The large clamp is removed in forty-eight hours; the small one twelve hours later. The iodoform gauze is left a day longer. On its removal a gentle douche may be given. Usually there is not much discharge, though in one of my cases two foul-smelling sloughs came away, and in another there was considerable serous oozing. By three weeks the vaginal roof is well cicatrized, and the patient able to go about.

In reviewing the operation as a whole, we see the following advantages in this method. (1) It allows of more rapid operating; (2) the vigorous traction controls all bleeding, and no hæmorrhage has to be attended to until the final stage, when the clamp is applied; (3) the splitting of the uterus allows it to collapse, and gives a fresh hold for the forceps; (4) the rotation of the uterus and the application of the clamp over the upper margin of the ligament first, enables one more easily and more certainly to get the whole ligament within the bite; (5) the weight of the clamp keeps the broad ligament pedicles down in the vagina (after ligature these might retract into the peritoneal cavity); (6) the layers of the peritoneum thus become apposed and are adherent above the clamps, which further favour drainage *per vaginam*.

These are the advantages which may be claimed for the clamp operation. In comparing it with the ligature, it has the undoubted disadvantage of a longer convalescence. Healing takes longer when the pedicle is left in the bite of a clamp than when tied by a ligature. On the other hand, as already said, the clamp allows a more rapid operation; so that here we have to balance the advantages of a shorter operation against a longer convalescence. We have an analagous case in the use of the clamp in the treatment of uterine fibroids. The extra-peritoneal treatment of the stump undoubtedly means a longer convalescence, but the advantages of a shorter operation, with the greater security against bleeding, more than compensate for this.

The six cases in which I have used this method are as follows:—

The first was a patient aged 29, who had five children, the last sixteen months before, and one abortion seven years previously. She had nursed the last child for fourteen months; and on weaning it had some hæmorrhage from the vagina which lasted a few days. A fortnight later she began to bleed, and as the bleeding continued for six weeks, she saw Dr Fordyce at the Cowgate Dispensary. He diagnosed commencing carcinoma of the cervix. The operation was done a few weeks later in Ward 28. The disease was localised to the cervix, the uterus not much enlarged and freely movable. The operation was accomplished more easily and more rapidly than any of the others, taking not much more than twenty minutes. I have seen this patient fifteen months after the operation, and there is as yet no recurrence.

The next case, Mrs A. R., was aged 55, and four years past the menopause. She had had bleeding from the vulva for seven months when Dr Donald saw her at the Cowgate Dispensary. Though the bleeding had lasted for some time, the physical signs were not well marked when she was first seen, the malignant infiltration being above the os externum, and, as was seen at the operation, affecting specially the cellular tissue between the cervix and the bladder. The operation was done in November last, ten months after the first bleeding. I found very great difficulty in separating the uterus from the bladder, and in doing so with the finger tore the bladder wall. An attempt was made to stitch it up at the time, but the fistula persisted. The margins of this, three months later, were noted to become indurated; and bleeding and a secondary nodule developed beside them. This patient is now showing symptoms of complications of the ureters, the urine is becoming scanty, and she has persistent headache. I think there was malignant infiltration of the bladder wall at the time of the operation, which explains the ease with which it was torn. Injury to the bladder and ureter is one of the risks in this method of operation. The latter is prevented by keeping the incision near the os externum anteriorly, and dissecting carefully until the cellular tissue demarcation between the bladder and cervix is reached. It is surprising that the ureter has not more frequently been injured. Landau describes fully its intimate connection with the bladder which pulls it up out of the way, so that if the separation be extended sufficiently to both sides of the cervix, there is no possible danger of injury to the ureter.

The third case was apparently[1] one of sarcoma uteri, which showed several points of interest. She was a virgin, aged 65, who had had bleeding from the uterus for six years, which latterly had been very profuse. When I first examined her I felt a small tumour distending the lower uterine segment, which I did not feel again until the cervix was dilated. The uterus was enlarged and

[1] Microscopic examination has since shown that it was carcinomatous degeneration of the mucosa in a uterus with multiple fibroids.

freely movable. Professor Simpson, who saw her with me, advised dilatation of the cervix and exploration of the uterine cavity. This was done, when I found the whole mucous membrane affected with sarcomatous degeneration, and a small polypoidal tumour, probably a fibroid. The operation was extremely difficult owing to the senile virgin vagina, and the enlarged uterus, which had a small fibroid in the posterior wall, and another in the substance of the anterior. I do not think I could have got this uterus out had it not been for Professor Simpson's kind assistance, and I am glad of this opportunity of saying how much I am indebted to him, not only for help in this case, but also for his introducing Doyen's method of hysterectomy into Edinburgh. It is through his having seen Doyen operating in Paris, and his having subsequently frequently operated in his own ward here, that this operation has come to Edinburgh, and come to stay. Twelve days after the operation in this case, the patient began to complain of incontinence of urine. At the time I satisfied myself that the urine was coming from the urethra, but I have never been able to exclude certainly a ureteric fistula, the patient objecting to the necessary examination to determine this. The incontinence is still present five months after the operation, though it varies in degree from time to time.

The fourth case was a patient aged 33, who had three children, the last eight years ago. She was under Dr Donald's care at the Cowgate Dispensary, who noted a suspicious nodule in the cervix, which broke down, leaving an irregular cavity with friable margins. The uterus was unusually large, and I found difficulty in applying the clamps in this case from the depth of the broad ligament. The large clamp just gripped it and no more, while on the right side the small clamp did not take in the whole ligament. This patient had a rise of temperature on the third day, which ceased when the gauze was changed. She was the only case that showed febrile symptoms.

In the fifth case, the hysterectomy was done for prolapsus uteri. The patient, aged 34, has had two children, the last seven years ago. Two years since she was admitted to Ward 28, suffering from complete procidentia, the uterus measuring 3½ inches. I amputated the cervix and repaired the perineum with a posterior colporrhaphy. The result at the time was satisfactory, but the prolapse recurred worse than before, the sound passing now 4½ inches, and the retroflexed uterus descending sometimes beyond the vulva. As a plastic operation had been tried without success, and the patient was anxious to get relief if possible by operation, hysterectomy seemed justifiable. With the uterus already outside the vulva, this would seem to be the easiest case of all on which to operate, but it proved the opposite. The tissues were so altered by the congestion and chronic inflammation that it was impossible to hit the line of demarcation between the

rectum and the uterus, and still more between the bladder and the uterus. I failed to reach the pouch of Douglas in the first instance from behind; and an assistant had to keep his finger in the rectum to prevent its being cut into. It was with great difficulty that I got the bladder dissected off the uterus in front and reached the utero-vesical peritoneum. From this I passed the finger into the pouch of Douglas and cut down upon it. In addition to the clamps some bleeding points had to be ligatured with catgut, and it seemed advisable to stitch the wound in the vaginal mucous membrane as far as possible with catgut. The operation took about two hours. The patient has done well.

The last case was a patient, aged 49, who had seven children, the last sixteen years ago. Till last December she had menstruated regularly, but since the New Year has had bleeding, at first continuous for five weeks, and then after three weeks' interval continuous again for another six weeks, when she was admitted to the Infirmary. The cervix was normal, the sound passed for 3½ inches and showed some irregularity of the uterine mucosa. I dilated the cervix till I could introduce the finger, when I felt a polypoidal hypertrophy of the mucosa localised to the right of the Fallopian tube angle. I removed these with the finger-nail, and submitted them to Dr Leith, who pronounced it a glandular cancer. When the uterus was being extirpated, a small ovarian or broad ligament cyst was discovered on the right side. A second clamp was put on beyond it, so that it could be removed with the uterus.

The fact that all these patients recovered without any bad symptoms shows that vaginal hysterectomy for cancer can take its place among the justifiable operations. Till recently the mortality was so great that it was doubtful whether removal of the uterus would ever take a position alongside of removal of the breast. The vaginal operation shows that it will. These cases are too few to reason from, so I give the statistics of a larger number. In this country I find that Jessett[1] records 70 cases of vaginal hysterectomy for cancer and sarcoma, with 6 deaths; while Purcell,[2] who did the first vaginal hysterectomy for cancer in England (the patient being still alive twelve years after the operation), has had 63 operations with 12 deaths. For hysterectomy in Germany we have the largest statistics given by Fehling,[3] who finds the mortality for 778 extirpations done by thirteen of the leading German operators as 9·1 per cent., the best results being those of Kaltenbach, who had, for 138 cases, a mortality of only 3 per cent.

Two questions of great practical moment are raised, when we

[1] *Brit. Gyn. Journ.*, 1896-97, p. 327.
[2] Discussion on Jessett's paper.
[3] Quoted by Buechler, *Zeits. f. Geb. u. Gyn.*, 1894, Bd. xxx, Hft. 2, S. 365.

estimate the value of this operation, viz., the frequency of cases in which operation is possible, and the results as to non-recurrence. In my experience, cases suitable for operation only exceptionally present themselves. We have a remarkable contrast in the experience of German operators. Krugenberg[1] treated 31·6 per cent. of his cases of malignant uterine disease by radical operation; while Kaltenbach[2] was able to operate on 40 per cent. (134 out of 452 cases seen over a period of seven years). Gusserow[3] found 15·4 per cent. of the 577 cases that came to his clinique operable. The latter proportion of 1 in 6 will accord more, I think, with the experience of Gynecologists in this country than the former of 1 in 3.

A still more important question is the result as to non-recurrence. Here again we must go to German operators for statistics large enough to be of service. Of 92 cases operated on by Kaltenbach, 23 were without recurrence more than three years after. Krugenberg finds after three years 37·5 per cent., and after four years 29·5 per cent., without recurrence, while Leopold[4] found that 55·8 per cent. out of 164 were without recurrence after four years. If immunity for four years is given to a fourth, the operation becomes justifiable; and Leopold's statistics of immunity to more than a half are very encouraging. Against this, however, we have Pozzi's rather pessimistic estimate, in which he describes it as a palliative treatment of longer or shorter duration, the average being one year.

The cause of recurrence after operation has become recently the subject of an interesting inquiry.

The *lymphatics* play the chief rôle in the dissemination of cancer, and it is to Poirier's researches as to their course, and the work of Seelig,[5] Winter,[6] Russell,[7] and others, as to their implication in carcinoma, that we must refer here. From Fig. 3 we see that the lymphatics from the body of the uterus pass through the upper part of the broad ligament to the lumbar glands, receiving on their way those from the ovary and Fallopian tube; while those from the cervix and upper part of vagina pass through the lower part of the broad ligament to the iliac or iliopelvic glands. A third and less important chain runs down the

[1] 'Die Resultate der oper. Behand. des Carcinom, etc.,' *Zeits. f. Geb. u. Gyn.*, 1892, S. 108.

[2] Buechler, *Zeit. f. Geb. u. Gyn.*, 1894, Bd. xxx, Hft. 2, S. 365.

[3] Oskar Müller, *Charité Annalen*, xviii, S. 529.

[4] "Die Dauererfolge der Vaginalen Totalextirpation, etc." *Geb. u. Gynäk.*, Bd. ii. aus der Konigl. Frauenklinik, Dresden—Leipzig, 1895.

[5] *Path. Anat. Untersuch. über die Ausbreit des Gebärmutterkrebs. Innaug. dissert.* Strasburg, 1894.

[6] "Uber die Recidive des Uteruskrebses insbesondere über Impfrecidive;" also, "Uber die Ursache der Krebsrecidive: *Z. f. Geb. u. Gyn.*, 1892, S. 141.

[7] "The Operative Significance of Metastasis and Post-operative Recurrence n Carcinoma of the Uterus:" *A. J. O.*, Dec. 1896.

round ligament to the inguinal glands. These lumbar glands surround the aorta and vena cava, extending as far down as the bifurcation of the common iliac artery, where they become continuous with the iliac or ilio-pelvic glands. These last, which receive the cervical lymphatics, extend from the bifurcation of the common iliac artery downwards in front of the internal iliac.

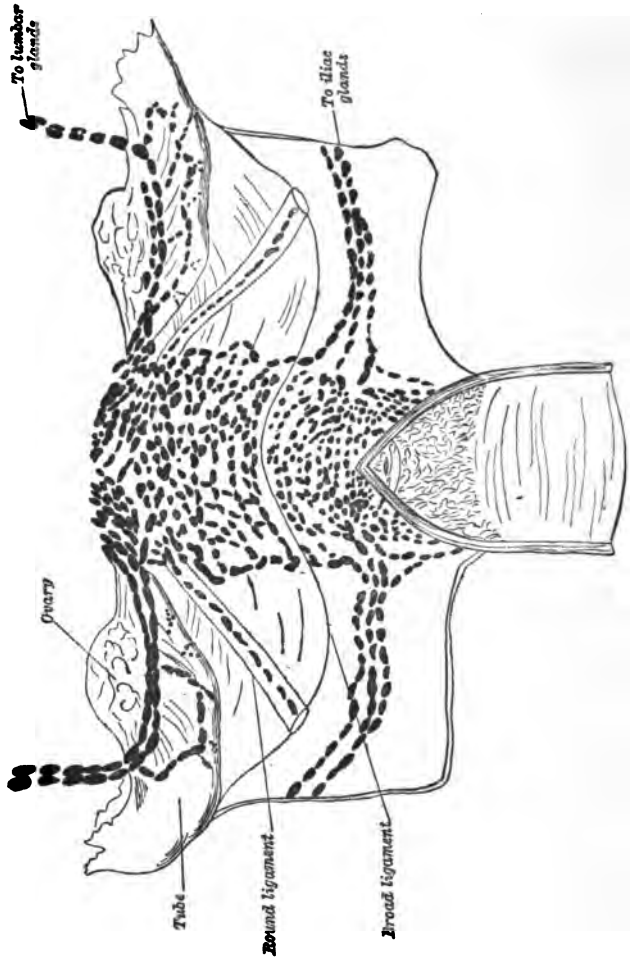

FIG. 3.—Lymphatics of Uterus (Poirier).

From the situation of the lumbar glands cancerous infiltration of them cannot be investigated directly, though it may be recognised through interference with the circulation. Cancerous ilio-pelvic glands, on the other hand, can be palpated *per vaginam* or *per rectum*. The inguinal glands, the most accessible, are very rarely

affected in uterine cancer. Russell figures an interesting specimen with nodules in the round ligament, evidently in the chain of lymphatics which follow it. Enlargement of the inguinal glands is frequent in affections of the vulva, but in such cases infection is by another route.

In an early stage of cancer, nodules may be found separate from the original focus, sometimes in a chain. Seelig has shown that these nodules are plugs of carcinomatous tissue, which have grown within the lymphatic vessel from carcinomatous epithelium carried by the lymph stream. The endothelium of the lymphatic vessel is not affected, as this microscopic section shows (Fig. 4).

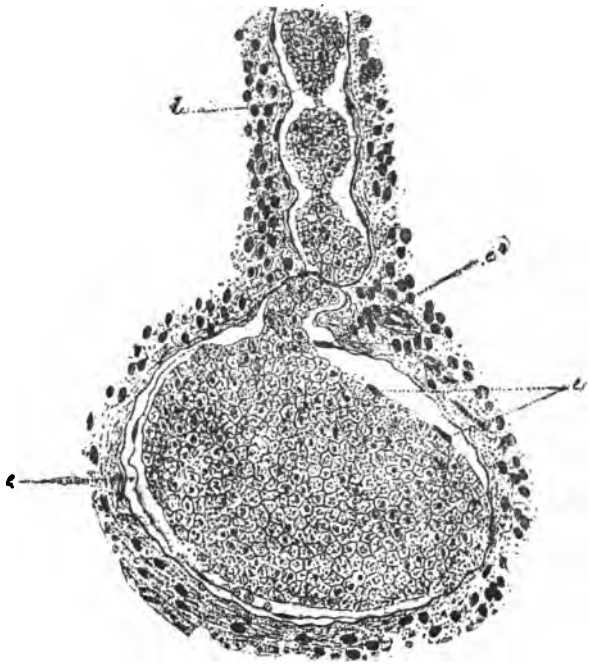

FIG. 4.—Plug of Cancer Cells in a Lymphatic Vessel (Seelig).
The endothelium is *in situ* at e^1, detached at *c*.

Stiles in an elaborate research on cancer of the breast, in which he has studied especially its relation to the lymphatics, believes that here also recurrence is due to cancer cells left in the lymphatics. He also notes that endothelium is not affected by these cancer plugs. Further, he believes in inoculation, as he says that a knife once used to cut cancerous tissue, should not be used again at the same operation.[1]

[1] "Contribution to the Surgical Anatomy of the Breasts," *Edin. Med. Jour.*, June 1892.

In cervical cancer, extension takes place along the lymphatics, and especially in those of the outer muscular layers; while in cancer of the body, the lymphatics of the mucosa and then those of the inner muscular layers are involved. This slower and more limited extension explains the better results, as to recurrence, in hysterectomy for cancer of the body as compared with that for the cervix.

The type and seat of the morbid process have both a bearing on recurrence. Thus it is less frequent after epithelioma than after carcinoma. Further, there is more immunity after operation in superficial cancer of the vaginal portion and cancer of the body of the uterus (whatever form the cancer takes) than in ordinary cancer of the cervix. In the former case it may be due in part to the type (epithelioma being more frequent there), but it is also due to a less extended invasion of the lymphatics in cancer of the body.

Local recurrence may be due to three causes:—(1), incomplete removal—cancer cells being left in the lymphatics of apparently healthy tissue; (2), unclean operation—cancer cells being inoculated on the raw surfaces at the operation; and (3), re-appearance of the disease from the same cause which originally produced it. Further, there may be metastasis in remote organs. The rapidity of the return suggests that it is due to one of the first two reasons. The second of these has been emphasised by Winter and Mackenrodt, and has this to be said for it: that in operating for cancer of the cervix the operator is often working in a hole with broken-down carcinomatous débris. Hence the operation is not clean, like the excision of a non-ulcerating breast. Further, the peritoneum, which is peculiarly susceptible to implantation, is also exposed. To diminish the risk, Winter recommmends removal of as much of the broken-down tissue as possible before extirpating, and the cleansing of the field with an alcoholic solution of corrosive sublimate.

Incomplete removal of affected lymphatics certainly plays an important part, and the study of the exact seat of the recurrence has a peculiar interest in connexion with its relation to lymphatic distribution. The suggestions of operations,[1] with more complete removal of the parametric tissue, show the importance of this.

Dr James Ritchie said that the paper was of great interest from a variety of considerations,—because of the historical account of the operation, the statistics of results, the systematic, clear, and

[1] As by Kelly, who passes a bougie into the ureter and removes the uterus by the abdominal method, ligaturing the uterine artery an inch from the uterus before it gives off the vaginal branch. (Clark—"A more radical method of performing Hysterectomy," etc., *Johns Hopkins Hospital Bull.*, vol. vi.) He mentions that of twenty vaginal hysterectomies, only four showed on microscopic examination that the cut surface was healthy.

concise description of Doyen's operation, and the modifications of it. It was of interest, not only to operative gynecologists, but also to those who are engaged in general practice. In view of such favourable results, including Dr Barbour's six consecutive successful cases, and Leopold's large percentage of those who remained free from recurrence after four years, the operation deserved favourable consideration. The difficulty which he experienced was that patients who suffered from uterine cancer did not seek advice sufficiently early. When there was deposit around the uterus, operation was useless. He heard with interest Dr Barbour's statement regarding the rarity of implication of the inguinal glands, because about four years ago Prof. Simpson had seen with him a case of carcinoma of the body of uterus in which these glands were affected. He asked Dr Barbour whether, in view of the tolerance of the peritoneum, statistics bore out his statement that sepsis was less rare after vaginal than after abdominal hysterectomy.

Dr N. T. Brewis had listened with great interest to Dr Barbour's paper, and he had sincere pleasure in congratulating him on his highly successful series of cases. Dr Brewis considered Doyen's method one of the best in which clamps are used. The chief recommendation of the clamp method is the rapidity with which the operation can be performed; its chief drawback is the difficulty that is experienced in removing the tubes and ovaries, along with the uterus, when a single large clamp is used on either side. The operation of hysterectomy for cancer is not justifiable unless the disease is confined to the uterus. Pain is the symptom which usually drives the patient to the gynecologist, but pain, unfortunately, is not an early symptom of cancer of the uterus; it usually does not occur until the disease has spread into the cellular tissue, so that when the patient comes to consult us it is too late. Dr Brewis believes this to be the reason why so few cases are met with suitable for operation. Hæmorrhage is an early symptom, but as cancer is most frequently met with about the menopause, patients consider it part of that phenomenon, and seldom seek advice until it has continued for a considerable period. But when one is consulted for bleeding, a thorough examination is called for, cervical erosions should be carefully treated, and portions of the cervix and endometrium should be examined microscopically when diagnosis is doubtful. When one considers how rarely cases suitable for operation are met with in this country, one cannot but doubt whether the German operators, who furnish such excellent statistics of ultimate recovery after hysterectomy for cancer, have been sufficiently careful to exclude non-malignant cases. Dr Brewis did not approve of vaginal hysterectomy for prolapse of the uterus, because removal of that organ weakened the pelvic floor, and the operation was apt to be followed by vaginal enterocele.

Dr Barbour thanked the Society for their kind reception of his paper. As to Dr Brewis's criticism, he should have mentioned that the appendages can easily be removed from the uterus, should this be thought desirable. He had not done it in most of his cases, because metatasis in the ovary is not frequent in uterine cancer, and patients suffer less after hysterectomy when the ovaries are not removed at the same time. He entirely endorsed what was said as to hysterectomy for prolapse, and the risk of enterocele. In this case, however, plastic operation alone had been tried before, and it failed. He was much obliged to Dr Fordyce for supplementing his paper with practical suggestions, which were of special value on account of the number of operations which he had seen and had to do with afterwards.

MEETING VII.—JUNE 9, 1897.

DR ALEXANDER BALLANTYNE, *President, in the Chair.*

I. *Dr Barbour* read the following report of the Committee appointed at last meeting to examine Dr Kynoch's specimen of apparent INTERSTITIAL PREGNANCY:—

REPORT OF COMMITTEE ON DR KYNOCH'S SPECIMEN OF APPARENT INTERSTITIAL PREGNANCY.

We have examined the specimen submitted to us by Dr Kynoch. It is difficult to say whether it is from a case of interstitial gestation, or from a rupture of the pregnant uterus. While the clinical history and the condition found at the operation suggest an interstitial gestation, the situation of the rent, the marked hypertrophy of the uterine wall (which resembles a retracted uterus), and the appearance of the Fallopian tubes, rather favour the latter view.

J. BERRY HART.
F. HAULTAIN.
A. H. F. BARBOUR.

II. ON THE CULTURE DIAGNOSIS AND SERUM TREATMENT OF PUERPERAL INFECTION, WITH ILLUSTRATIVE CASES.

By F. W. N. Haultain, M.D., F.R.C.P. Ed.; Lecturer on Midwifery, Schoo of Medicine; Gynecologist, Deaconess Hospital, Edinburgh.

At the present time, when the serum treatment of disease is being so energetically developed, authentic and carefully observed clinical cases are not only interesting, but are of value in assisting the organisation of a plan of campaign against disease, which threatens to revolutionise medical treatment as a whole, and at the same time place it on a sound scientific foundation previously unattainable. Having been fortunate enough to have had the opportunity of observing three cases of puerperal infection, and treating them by this method, I therefore propose to record them. They are as follows:—

Case 1.—Mrs C., primipara, was confined on 28th October 1896. As the labour was much delayed, low forceps were applied, and delivery easily accomplished. The puerperium for the first ten days immediately succeeding was apparently normal, with the exception that the strength was not regained with the usual rapidity. The temperature and pulse for the first few days were normal, and therefore further record was not continued. On rising on the twelfth day the patient immediately fainted, and had to return to bed, where she remained for a week. During this time the temperature remained below 100° F., but the pulse was feeble and markedly increased in rate, ranging from 95 to 105 beats per minute. There was no pain or evidence of local mischief.

She attempted to rise again for a short time, but felt weak and unable for the least exertion. On the twenty-sixth day she complained of severe pain and swelling in the right thigh. This was associated with a rise of temperature to 101° F., and pulse 110. These symptoms rapidly passed off; but, on 27th November, the thirtieth day of the puerperium, she was suddenly seized with an intense pain in the left thigh and calf, associated with much swelling of the limb and severe constitutional symptoms, such as vomiting, sweating, and faintness. Temperature, 102° F.; pulse, 120.

As the symptoms increased in severity, I was asked to see her by Dr G. Donald, on the 29th of November. She was now in an extremely prostrate condition, rejecting all food, and highly fevered. Temperature, 103°·8 F.; pulse, 130, irregular and feeble. The left leg was much swollen and intensely tender. Pelvic examination by the bimanual revealed a subinvoluted uterus and a slight swelling in the left broad ligament, but visually nothing abnormal could be made out. As a somewhat fœtid smell

was present on the examining fingers, I thought it desirable to procure a culture in agar from the interior of the cervical canal. This I accordingly did, as also from the blood drawn from the finger tip. The uterine cavity was then thoroughly washed out with 1 to 4000 corrosive solution. In the evening the temperature had fallen to 102°·2, though the pulse remained at the same rate, 130. On the following day, the anxious symptoms having in no way abated, and as the agar tube inoculated from the cervical cavity showed a typical pure culture of the Löffler bacillus, I injected 10 c.c. of the antidiphtheritic antitoxin, with the truly astonishing result that in the evening the temperature had fallen to 99°·6, and the pulse to 95. Next morning the pain in the leg had much abated; vomiting ceased. Temperature, 100° F.; pulse, 98. As the temperature again slowly rose during the following two days, Dr Donald again injected on two successive days 10 c.c. of the antitoxin, after which the temperature fell to normal, and the pulse to 82. Since this time the patient made an uninterrupted return to health.

No direct evidence of infection could be elicited, no cases of diphtheria being known of in the vicinity, while Dr Donald had not attended a case of diphtheria for weeks previously. On inquiry regarding the drainage of the house, we were assured that the house-factor some months previously had given a declaration that the drains were perfect; on examination, however, by the sanitary engineer, it was found they were in anything but a sanitary state.

CASE 2.—Primipara, was confined normally on 4th March. Forty-eight hours afterwards she suddenly developed marked feverish symptoms, ushered in by a distinct rigor. Temperature, 103°·6 F.; pulse, 120. The uterus was at once washed out with an antiseptic solution, a process which was repeated twice on the following days, as no remission of the symptoms had taken place. On 8th March I was asked by Dr Aitchison Robertson to see her. Her condition at this time betokened marked septic infection. The abdomen was much distended and painful on pressure, though the uterus appeared normally involuted. On the legs and abdomen there were present slightly elevated erythematous patches, while the face had that leaden appearance and anxious expression so often seen in these cases. Temperature, 101°·8 F.; pulse, 140.

A culture in agar was taken from the cervix, and the uterus again washed out. Examination of the culture on the following day showed a mixed growth of streptococcus and *B. coli communis*. It was decided now to try the serum treatment, and 10 c.c. of antistreptococcus serum, made by the British Institute of Preventive Medicine, was injected. As the result was negative, a further 10 c.c. was injected on the following day, and repeated with 30 c.c. the day after, but with no beneficial effect whatever. The patient on the day I saw her, 8th March, developed an intense

and persistent diarrhœa, which could not be controlled. The left knee-joint also became extremely painful and slightly swollen. Pulmonary complications, giving rise to extreme rapidity of breathing, also occurred; and on 12th March, the day before she died, a right parotitis of a very virulent character was present. For twelve hours before death there was evident an exaggerated condition of exophthalmos. On 12th March, twenty hours before death, a culture was taken from the blood procured from the tip of the finger. This showed a pure growth of the *B. coli communis*, which, from its reactions, was extremely active and virulent.

The disease thus lasted but a week before terminating in a fatal issue. It may be of importance to mention, the patient, a coachman's wife, was confined in a room immediately above a stable, the atmosphere being highly impregnated with the smell of equine excreta.

CASE 3.—VI.-para, was attended by a neighbour through a normal confinement. On the third day of the puerperium the patient had a distinct shiver, and for the four days following had been extremely feverish, suffered from considerable pain in the lower abdomen, and was at times delirious. On being called to see her at this time, I found her in a somewhat grave condition. Temperature, 103° F.; pulse, 124. Abdomen somewhat distended, and painful on pressure. The expression was anxious, breathing rapid, and a free perspiration visible. Vaginal examination showed the uterus to be enlarged and tender, but little or no evidence of surrounding inflammatory mischief. Vaginal discharge distinctly offensive. Cover-glass specimens of the discharge were made, and the uterus thoroughly washed out with 1 to 2000 corrosive. A microscopic examination of the discharge showed many streptococci. On the following day, the temperature being 102°·2, pulse 128, 10 c.c. of antistreptococcus serum was injected, the uterus washed out with carbolic, 1 to 40, and packed with gauze soaked in the antitoxin. The same evening, temperature 101°·8, pulse 100. Next day, the temperature and pulse remaining much the same as on the previous evening, the uterus was again washed out, and a further 10 c.c. antitoxin injected. By the evening the temperature had fallen to 100°·4 F. and the pulse to 76. No further rise of temperature or pulse occurred, but a further cover-glass preparation of the cervical discharge was made, which showed many streptococci. The uterus was washed out on the two succeeding days, by which time the condition of the patient was so favourable that further treatment was discontinued, there being, from further examination of the discharge, no evidence of septic organisms.

On review of the cases cited, it will at once be evident that we have to deal with three distinct varieties of infection,

resembling one another somewhat in their gross clinical aspect, but strikingly dissimilar in detail.

Case 1 is of special interest, in showing that we may have a true intra-uterine diphtheria, localised probably to the placental site, giving rise to dangerous constitutional symptoms of bodily prostration, anæmia, and enfeebled cardiac action, without external evidence of its true character being revealed. In this position the diagnosis from clinical phenomena cannot fail to be exceptionally difficult, if not impossible, and in this case in particular, had it not been for the incontestable evidence gained from the culture, I feel certain the true character of the infection would have still remained a mystery. The case is of further importance in attesting to the now almost universally accepted value of the serum treatment of this dread disease.

Case 2 offers many features of practical importance, both from the pathological and clinical standpoint. As regards the former, we have the presence of the mixed infection in the culture from the cervix, with the ante-mortem pure culture of the *Bacillus coli communis*, as obtained from the blood twenty hours before death. From the clinical aspect, the violent diarrhœa, the erythematous patches, and the absolute inefficacy of the antistreptococcus serum, are of value in corroborating the observations already made by Chantemesse, Bosc, and Marmorek, on infection due to the *B. coli communis*.

Case 3 cannot be reckoned of much value, as it is possible that here we had to deal with only a simple toxin poisoning or sapræmia, which, as is well known, yields readily in most cases to antiseptic intra-uterine douching, which removes the focus of infection. Still it must be noted that intra-uterine douching had almost no effect until combined with the serum treatment.

The value of the methods adopted may be most satisfactorily considered from the points of view of diagnosis, prognosis, and treatment.

As a diagnostic the culture method is far ahead of anything yet advanced. True, the microscope may reveal the presence of each individual organism, but no idea can be gained of its vitality or virulence. This has been demonstrated by Kiefer, who compared a large series of cases in this connexion, and found that only a proportion of cases, which showed the presence of virulent organisms microscopically, gave any evidence of activity. As supporting this contention, the presence of streptococci in the discharge from Case 3, after the cessation of symptoms, is of interest, in so far as it is probable that, though present, they were either dead, or so crippled as to be entirely innocuous. The strongest point in favour of diagnosis by cover-glass preparations examined by the microscope is undoubtedly its rapidity, fifteen minutes being sufficient; while, naturally, the culture method cannot be completed under twenty-four hours. Had the culture method been here

adopted, and virulent streptococci been found to have been present in the discharge, even after the intra-uterine washing and plugging, more satisfactory evidence of the effect of the antistreptococcus serum would have been gained.

Though valuable as a diagnostic, in so far as the actual recognition of the organisms is concerned, it is probable that, by the close observation of a number of cases, we will soon be able to associate certain clinical symptoms with each variety of infection, and thus to a certain extent render unnecessary the employment of culture diagnosis in many cases. In this respect the diarrhœa and erythematous patches seem to be more or less characteristic of infection with the *B. coli communis*, and in the same manner it is possible that specific clinical detail may eventually be discerned which will guide us in the discrimination between infection due to streptococci or staphylococci.

From a prognostic standpoint, we doubtless have in the culture method of diagnosis a most valuable indicator. With the present methods of treatment at our command, the prognosis varies very greatly, according to the organisms we have to deal with. In this respect the statistics of Marmorek are of value. In fifteen cases of puerperal fever treated by the serum method, seven were due to pure streptococcus infection, and of these all recovered; five were due to a mixed infection of streptococci with staphylococci; of these two died; while the remaining three cases were due to a mixed infection of streptococci with the *B. coli communis*, and none recovered. It is thus evident that, in mixed infections, the prognosis is much graver, particularly so when the presence of the *B. coli communis* is ascertained. This saprophytic organism would appear in these cases to owe its virulence to its association with others, for alone it seems to be less harmful, and appears to develop active pathogenic qualities when stimulated by the toxins of co-existing germs; a condition which is closely allied to the increased virulence and activity of mixed pathogenic bacilli. The inference that a pure infection by streptococci can always be treated successfully by the serum method, as one might be led to suppose by Marmorek's statistics, has received a rude shock from Charpentier, who records sixteen such cases with seven deaths. Yet the evidence distinctly points to a more favourable termination of the disease should a simple streptococcus infection be found.

From the recognised salutary effect of the diphtheritic antitoxin, one might consider the prognosis favourable if a pure culture of the Löffler bacillus be found, as shown in Case 1 cited.

Though still in an embryonic stage, the serum treatment of puerperal fever gives promise of arriving at a ripe maturity. In diphtheria its benefits are practically substantiated, and similar results may reasonably be expected in regard to septicæmia and allied affections. Here, however, we have naturally to deal with

a much more complicated state of matters, through having to combat the organisms themselves in the general circulation, and not merely, as in diphtheria, in a localised site. As in diphtheria, so in sapræmia, we have an antitoxin which combats only the poisonous products of specific germs; and so far it is probable that the antistreptococcus serum of Marmorek is of benefit. But it has yet to be shown that this serum has bactericidal as well as merely antitoxic properties, before much can be expected of it. True, the experiments of Emmerich on mice point to this direct poisonous action of the serum on the organisms, but clinical examples of successfully treated cases of undoubted infection of the patient by the cocci themselves, as evidenced by metastatic deposits or blood cultures, can alone satisfy as to the value of the treatment. Even granted this has been established, many other virulent organisms will have to be similarly dealt with, each apparently requiring a special antidote. But it is probable that even in mixed infections the antistreptococcus serum may have beneficial effects, through destroying the toxins of the streptococcus, which probably act as a ready medium for the growth and increased activity of associated microbes. To assist, therefore, in this campaign, closely observed and thoroughly investigated clinical cases are of much value, and by those of us in the immediate vicinity of a laboratory no valid excuse can be made of inability to acquire all necessary requirements.

The haphazard injection of antistreptococcus serum in all cases of puerperal fever is, to say the least of it, treatment of a most empirical order; it may doubtless give in certain cases excellent results, but no deductions of any value can be formed, to assist in the treatment of future cases. It amounts, in fact, to treatment without an attempt at diagnosis, at all times unworthy of a scientific profession. The actual injection of the serum seems to be devoid of much risk, although in a few cases anxious symptoms, and even deaths, have been said to have occurred from its use. It has also to be strongly urged that, along with the serum injection, energetic attempts must be continued to destroy the power of infection by thorough antiseptic douching, curetting and packing of the uterus, as it is probable the serum has but a modified effect on the organisms themselves in comparison with its antitoxic properties. As regards the effect of packing the uterus with gauze soaked in antitoxin, little can be as yet decided, but it seems worthy of further trial, especially if, as has been claimed for it, the serum has a bactericidal as well as an antitoxic action.

If beneficial results are to be expected from the antitoxin treatment, they are usually early apparent, and are commonly indicated by the marked fall of the pulse-rate, the decrease in temperature being of later appearance. This, though already described, is well exemplified in Case 3. Repeated injections of serum seem to

be necessary to maintain benefit derived from its use; this probably is explained by the toxins of streptococci having but a feeble immunising effect, a circumstance which accounts for the recurrence of erysipelas so frequently in the same patient.

In an article appertaining to a subject of such importance as puerperal fever, one is tempted to digress from the main issue and wander over the more general questions of the preventive treatment of septic infection. That it can be avoided is proved by the recent Maternity Hospital statistics, gathered by Godson. And in digressing I might be forgiven for strongly urging the importance of syringing the vagina immediately after all labours, once for all, with a strong antiseptic solution, such as 1 to 40 carbolic. It has been conclusively demonstrated that in a certain proportion of cases, the vagina of the normal parturient contains microbes of a pathogenic type. These, according to Strogonoff, Kroenig, and others, are so acted upon by the vaginal and cervical mucus that they are impotent. But, as is well known, feeble organisms, under altered conditions, may suddenly develop a most virulent rôle; and it would appear to me that their absence is infinitely more desirable than their enfeebled presence. I am well aware I am treading upon most debatable ground in advising this procedure, and am perfectly conversant with the experiments which have been produced as corroborative of the absolute bactericidal properties of the vaginal and cervical mucus.

But if these are to be accepted *in toto*, what need is there of aseptic midwifery? Infection seems impossible! Yet we know from hospital statistics, collected by Godson and others, that through strict asepsis, and in many cases post-partum vaginal syringing, puerperal fever has been practically stamped out, while in private practice it remains as it was twenty years ago (Cullingworth). Reasoning *à priori* from these facts, we are bound to accept that the aseptic and antiseptic management of obstetric cases is to be practised, to prevent the entrance of pathogenic organisms; or, in other words, that we cannot trust to the natural germicidal action of the vaginal and cervical secretions.

In hospital practice asepsis can be carried out thoroughly, and antiseptic douching may be unnecessary, but in the majority of private cases such strict asepsis is quite impossible, and antisepsis should take its place. To meet with this requirement the thorough syringing of the vagina with a bactericidal solution (1 to 40 carbolic) seems the most ready and efficacious method, and is most strongly to be recommended. In favouring this I cannot too strongly impress the necessity of using a solution of germicidal strength, for too frequently is syringing performed with water from a dirty basis, to which a few drops of carbolic or Condy's fluid have been added, a procedure which tends to inoculate rather than disinfect.

In this connexion the choice of an antiseptic is of importance,

and I might draw attention to the recent experiments of Gippert, Behring, and Crookshank, on the greater value of carbolic acid as a germicide, as compared with the popular corrosive sublimate solutions.

Carbolic acid (1 to 40), acting for but one minute on staphylococci and streptococci, is shown to be sufficient to destroy them; and a weaker solution has a similar effect on sporeless germs, such as the *B. coli communis*. On the other hand, corrosive sublimate solution (1 to 1000) failed to destroy the vitality of similar cocci, even after an hour's contact.

To summarise the value of the serum treatment, it may be said—

1. The benefits of the serum treatment of puerperal infection cannot, as yet, be said to be proved, although it gives promise of much value. The proof practically rests in the demonstration of its bactericidal as well as its antitoxic properties.

2. It should be adopted early, and be continued after the grave symptoms have subsided.

3. Its value is apparently diminished in mixed infections, although in these cases it is not to be considered useless.

4. In no case should treatment be confined to the serum injection. It must be associated with local applications, such as uterine douching and curetting, and free general stimulation; also, if need be, with induced hyperleucocytosis, by the injection of nuclein.

5. If possible, in all cases a culture diagnosis should be made to assist in furthering scientific investigations from a clinical standpoint.

The above cited cases, individually or collectively, cannot in themselves be of much value; but my desire in recording them has been to add another grain of evidence in favour of bacteriology, and, if possible, to assist in the truly magnificent warfare it is waging against one of the most terrible scourges of womankind. I cannot close without acknowledging the invaluable assistance I have derived in these investigations from the laboratory of the Royal College of Physicians of Edinburgh.

Dr Barbour thought Dr Haultain's paper was of special interest as drawing attention to a subject which had not received the notice it deserved. Too much, however, must not be expected from the examination of the lochia as an aid to diagnosis. In reviewing recent German literature on this subject, he has been struck with the fact that at present there was a reaction against the position taken up previously of the importance of the presence of germs as throwing light on the etiology of inflammatory conditions. He referred to the results of Krönig and Menge as overturning the view of Döderlein, that we could distinguish between a physiological and pathological secretion. According to Döderlein, pathological secretions were alkaline, and showed different micro-

organisms, saphrophitic and pathogenic, while physiological were acid and contained the vaginal bacillus. Further investigation had, however, shown that this distinction, which promised to simplify the study of infection, did not hold. As regards the question raised by Dr Haultain of the advantage of prophylactic injections, the demonstration given by Menge of the natural germicidal action of the secretion must be borne in mind. It had been shown that injections of corrosive sublimate weaken this germicidal action. As the result of this inquiry, this mode of treatment had been discontinued at the Maternity at Leipsic, and septic infection in the puerperium had diminished rather than increased as compared with the period during which prophylactic injections were used.

Dr Keppie Paterson referred to the statement of Dr Barbour with regard to the trend of German opinion in favour of asepsis. Having visited Winckel's clinic in Munich last autumn, he found aseptic treatment being carried out, but yet they had puerperal fever. In private practice it was impossible to carry out this method as in a well-appointed hospital. For example, the bowels might move about the end of labour, and despite washing, it could be easily understood how a few *B. coli commune* might be carried into the vagina. For several years he had made a practice of always dipping the fingers into antiseptic lotion before examination, and used an antiseptic douche after each labour. This latter he considered the main safeguard of a woman in childbirth.

Dr Jardine said that he had listened to Dr Haultain's paper with great pleasure. In Glasgow they had had several very successful cases reported. He had had no cases of his own, but he would like to say in reference to the routine douching of the patients, that he did not believe in it. In the Maternity Hospital in Glasgow septic cases had been very common last year. When he had taken charge of the hospital he had stopped routine douching, and had insisted on thorough cleansing of the external parts and of the examining hands. During the months of March and April, when he was in charge, they had had no bad cases. Only in operative cases were douches given. In the hospital he had a steriliser introduced, and sterilised everything that came in contact with the patient.

Dr Alex. Ballantyne was much interested by Dr Haultain's observation on the increased virulence of microbes by admixture with others. Dr Ballantyne's routine practice is to thoroughly cleanse parts, douche frequently before birth of child, but not subsequently. Dr Ballantyne believes in the germicidal power of the blood discharged from the vagina, and never douches except when the blood tends to become fetid.

Dr Haultain thanked the Society for the free discussion they had given his paper. He was prepared to run the gauntlet when he

suggested syringing the vagina as a routine practice after labour, as he knew it had been discontinued in Leipzic and elsewhere with evidently satisfactory results. Still one could not compare hospital practice with general, and it was practically impossible in many cases to carry out perfect asepsis in private cases, and vaginal syringing (or uterine, where necessary) with a bactericidal solution appealed to him as consistent with the best interests of the patient. He particularly wished to emphasise the use of a bactericidal solution. If the vaginal and uterine secretions had such bactericidal properties as assigned to it by some investigators, what was the use of asepsis? innoculation would seem an impossibility! His main object in bringing forward the contribution was to stimulate those who were in active practice to assist the research of bacteriologists in as far as possible a scientific manner, by actually ascertaining what form of infection they were treating, and not to give the scientific valueless result of serum treatment on so-called puerperal fever, of which there were infinite varieties, and which they in no way tried to differentiate.

II. *Dr Berry Hart* read a paper on THE MORPHOLOGY OF THE VAGINAL SEGMENT OF THE GENITAL TRACT, which was illustrated by lantern slides. Owing to the lateness of the hour no discussion took place.

III. THE FURTHER HISTORY OF A CASE OF FIBROID TUMOUR TREATED BY ELECTRICITY.

By R. MILNE MURRAY, M.A., M.B., F.R.C.P.E., F.R.S.E.

ON the 4th March 1894 I read before this Society the "Notes of a Case of Fibroid Tumour treated by Electricity." The patient, a woman of 32, had been under observation for some time, and when the treatment by electricity was commenced she had suffered for some months from excessive hæmorrhages, which had so prostrated her that she was practically bedridden, and the tumour was as high as the umbilicus and more prominent than a six months' pregnancy. The hæmorrhage diminished after a few applications, and in less than a month after they were begun, she was able to walk a short distance with comfort. After forty applications, extending over a period of fourteen months, the tumour, at first gradually, and then somewhat quickly, disappeared almost completely. At this time the uterus felt about the size of a second month pregnant uterus, and seemed somewhat bound to the right, as if by a shortened broad ligament. This was on January 27, 1894. After this date a few more applications were made, but as the periods were becoming rather scanty, they were discontinued in March, and the patient expressed herself as being very well and comfortable,

I saw the patient at intervals during the rest of 1894, chiefly on account of attacks of dyspepsia, to which she was subject. In other respects she was very well, though her menstruation continued very small in amount, and towards the later months of the year seldom occupied more than a single day. I examined her in December 1894, and found that the uterus measured 2½ inches by the sound, and the cervix had become very small and hard, suggesting the condition found in senile atrophy. The right fornix was full and tender, but no definite mass of any kind could be made out.

She went home to Shetland in the spring of 1895, and I did not see her again till September 1895. She came to see me on the 13th of that month, and told me she had been very well indeed all the summer, but latterly she had begun to suffer from attacks of acute pain low down in the abdomen, and that she sometimes had difficulty in retaining her water. Her periods were still very scanty, and she noticed that the abdominal pain was always worst just before the period was due. On examination I found the cervix small, conical, and pushed away to the left side. In the right fornix a firm roundish mass about the size of a hen's egg could be felt. It was painful on pressure and apparently fixed, but it was difficult to say whether it was growing from the uterus or not.

It seemed dense and solid, and my impression was that it was the old fibroid growing again, or else a new one beginning to develop. The canal of the cervix was so contracted that I could not pass an ordinary sound, and it was only after much difficulty that I could pass a No. 2 male urethral bougie. The uterus was not more than 2½ inches in length. Under the assumption that it was a fibroid, I advised that the electrical treatment should be resumed, but I found that the pain produced by 20 milliamperes was so great that it was useless to continue the applications, and they were abandoned. I saw the patient from time to time during the following months, and watched the gradual growth of the mass. By the end of March 1896 it was well above the brim of the pelvis. It was tender on manipulation, but had certainly begun to be less dense, and felt more as if it might contain fluid. The attacks of pain had become less marked, and the patient was able for her household duties. As the growth was, however, alarmingly rapid, I tried a few more applications of electricity, in the hope that it might do something to check it, but they only seemed to aggravate the pain, and we were compelled to abandon them. The patient left Edinburgh for the summer, and I heard no more of her till the beginning of September last, when she came to see me. I was at once struck with the great size of the tumour, which had now reached half-way between the umbilicus and the ensiform cartilage, and gave her the appearance of a woman at the eighth month of pregnancy. Beyond occasional

attacks of pain low down in the abdomen she complained of no discomfort. But she looked ill and emaciated, and had a distinctly pinched expression. The tumour felt dense and firm over its greater area, but an indistinct percussion thrill could be obtained at one or two points. The rapid growth had alarmed her during the summer, but she had kept away for fear of an operation. I explained to her that her only chance of relief was by an operation, and after some delay she agreed. I had arranged for her to go to St Luke's Home on the 1st October.

By this time the attacks of pain had greatly increased in frequency, and on the 29th and 30th September she had suffered a great deal. On the evening of the latter I was sent for, and on arriving found her collapsed, with a weak fluttering pulse. About an hour before I saw her the pain had been intense, and after an effort to raise herself in bed she gave a scream, and the collapse came on. On passing my hand over her abdomen I was surprised to find that the tumour had apparently ruptured, a solid mass remained in the right side nearly as high as the umbilicus, and the abdomen contained a large quantity of fluid. Under the use of hypodermic injections of ether and other restoratives she gradually rallied, and a day or two afterwards she was removed to St Luke's Home. Day by day the fluid diminished, the solid mass seemed to settle down in the right side, the patient's strength improved, and after three weeks she went home, being able to move about and do a little work. Matters continued thus until the end of November, when the return of the pain and the rapid increase in the size of the tumour showed that the cyst was again filling. On the 12th December 1896 it had reached to the level of the umbilicus. On that day, assisted by Dr Haultain, I opened the abdomen and found the tumour to be a papillomatous ovarian cyst. It was adherent in every direction—to the parietal peritoneum, to the bladder, to the intestines, large and small. After much difficulty and the application of many ligatures, the anterior adhesions were separated, and on passing the hand round towards the right side a large cauliflower-like mass could be felt growing from the tumour, probably at the site of rupture. The greater part of the mass to the right and front was found to be nearly solid; while to the left and behind, a cyst about twice the size of a closed fist could be felt. This was tapped, and the further separation of the adhesions was proceeded with. This proved a very tedious process, and it was found to be impossible to secure a reasonable pedicle. Accordingly the most fixed part of the tumour was ligatured in three pieces and the mass removed. There was a good deal of oozing from the various adhesions, and a drainage-tube was left in the lower angle of the wound. Before closing the wound the uterus was carefully examined. The organ was long and narrow, and at the right angle it was somewhat denser and somewhat lop-sided. This seemed all that remained of the former

fibroid. The patient was very much collapsed after the operation, which, considering the amount of blood lost and the tedious character of the operation, was not to be wondered at. But she made an excellent recovery, and the temperature never was above 100° at any time, and was normal after the fourth day. There was a great deal of discharge from the tube for about ten days. After this the amount rapidly diminished, and by the fourth week was limited to a few drops of a clear fluid. At the end of the fifth week she went home, and is now able for her ordinary duties, and can walk a couple of miles without much fatigue. There is, however, a minute sinus, from which every few days a small quantity of fluid escapes.

This case appears to me to be of much interest in relation to the electrical treatment of fibroid tumours. The previous history of the case as recorded in my note in 1894 was sufficient to show that a woman, prostrated to an extreme degree by the loss of blood from a fibroid tumour, may be restored to health by a comparatively short course of electrical treatment. That the tumour practically disappeared, if not as a result of, at least during and after that treatment, is shown not only in this case by the ordinary methods of examination, but also by the direct observation of the uterus itself. It is certainly a matter of considerable interest that a fibroid tumour as large as a six months' pregnancy may become actually absorbed so as to leave barely a trace behind. It was indeed a remarkable thing that this unfortunate patient should have become the subject of another and different neoplasm in so comparatively short a time. And it was a most unfortunate circumstance that the nature of this second growth was not recognised earlier, for it need not be doubted that an earlier operation would have been an easier one. But I was misled, first, by the fact of there having been a fibroid there before, and I naturally assumed that the new tumour was simply the former one become progressive again, and second, by the apparent firmness and solidity of the mass. It is of course easy to be wise after the fact, but it is obvious now that I should have laid more stress on the symptoms of rapid growth, on greatly diminished menstruation, and also on the pain induced by the small currents employed in the resumed treatment. I explained away the rapid growth by assuming that the tumour was of a fibro-cystic type, the diminished menstruation by the assumption that it was subserous, and the pain by presuming that an ovary had got in the way. One realises better now the significance of these symptoms.

MEETING VIII.—JULY 14, 1897.

DR ALEX. BALLANTYNE, *President, in the Chair.*

I. The following gentlemen were elected Honorary Fellows of the Society:—Sir John Williams, Bart., M.D., London; George Granville Bantock, M.D., London; and Paul F. Mundé, M.D., New York.

II. A discussion on "Are Checks to Conception ever Legitimate?" was opened by Dr Halliday Croom, and taken part in by Drs Connel, M'Vie, Buist (Dundee), Stitt Thomson, A. D. Webster, Milne Murray, Haultain, Moorhouse, Haig Ferguson, and the President. Dr Croom replied.

The Society thereafter dined together. Dr Alex. Ballantyne, President, presided at the dinner, and Dr Milne Murray acted as croupier.

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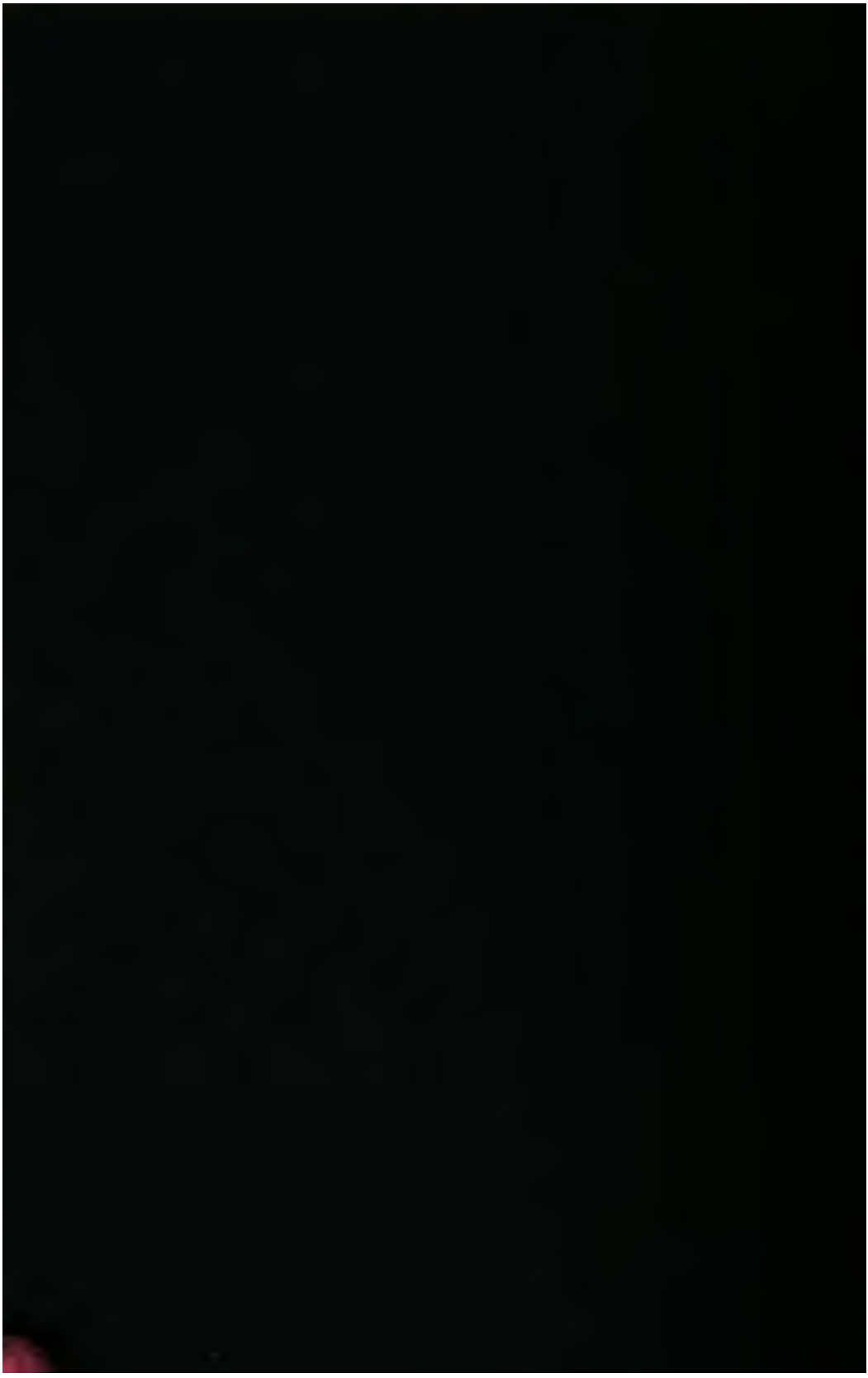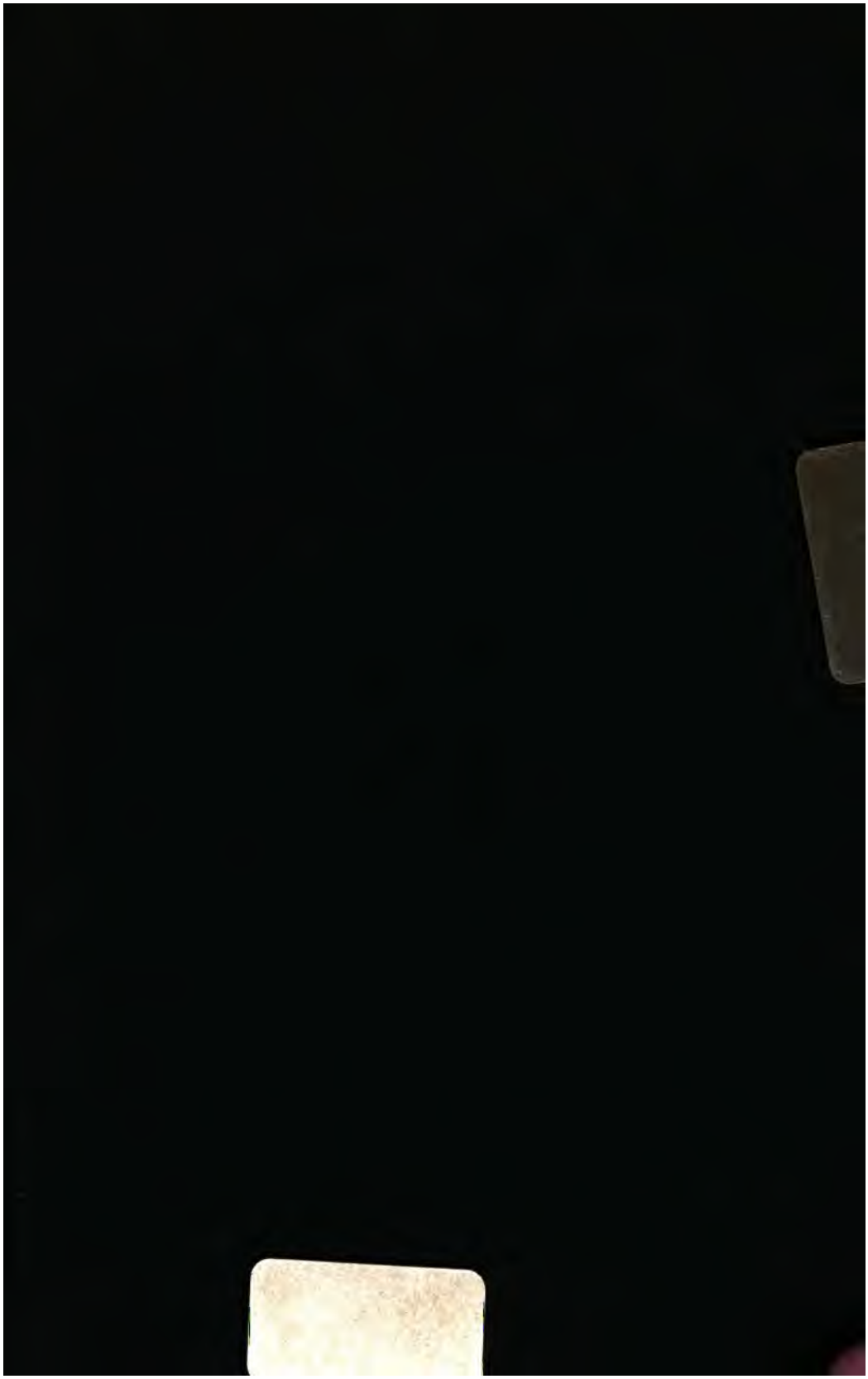
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